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WASTEWATER CHARACTERIZATION SURVEY, HOLLOMAN AIR FORCE BASE, NEW MEXICO

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Personnel from Armstrong Laboratory Water Quality Function conducted a wastewater survey at Holloman AFB from 12 to 23 Aug 91. The scope of the survey was to characterize the wastewater entering the current treatment facility (a lagoon system). This characterized data will be used in the design of a wastewater treatment facility at Holloman AFB, NM. Another objective was to sample specific sites for wastewater quality. Significant findings were very low Biochemical Oxygen Demand entering the treatment facility and very high chloride concentration in the wastewater.

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WASTEWATER CHARACTERIZATION SURVEY, HOLLOMAN AIR FORCE BASE, NEW MEXICO

INTRODUCTION

A wastewater characterization survey was conducted at Holloman Air Force Base (AFB), New Mexico, from 12-23 August 1991 by personnel from Armstrong Laboratory (AL) located at Brooks AFB, Texas. Influent samples to the Sewage Treatment Plant (STP) were collected and analyzed for various parameters. The sample results will be used by HQ TAC/DESU for the design of a new Wastewater Treatment Plant (WWTP) at Holloman AFB. Specific sampling sites around base were also sampled for various parameters. These sample results were intended for use by Holloman AFB personnel to identify toxic discharges they may have in the wastewater collection system.

The survey was performed in response to a request from HQ TAC/SGPB to perform a characterization study to support the Architect and Engineer (A & E) design of the WWTP.

Armstrong Laboratory personnel performing the survey included 1st Lt Darrin L. Curtis (Project Engineer), Capt Paul T. Scott (Chemist), 1st Lt Michael C. Carter, and 2d Lt Anita M. Acker.

DISCUSSION

Background

Holloman AFB is located in south-central New Mexico, approximately 7 miles west of the city of Alamogordo. The Tactical Air Command (TAC) has operated the base since 1971, and currently, the 833d Air Division is the host organization. Major TAC organizations located at the base include the 49th Tactical Fighter Wing (TFW), the 497th Tactical Training Wing (TTW), the 833d Combat Support Group, the 833d Medical Group, and the Deputy Commander for Resource Management, which includes the 4449th Mobility Support Squadron (MOBSS). The base is also preparing for the arrival of the F-117.

To support these organizations and their missions, several industrial facilities are located at the base: aircraft and vehicle washracks, corrosion control facilities, and equipment maintenance facilities. An electroplating facility is also located at the base, but the electroplating operations have been discontinued.

The existing wastewater facilities at Holloman AFB include a number of oil/water separators, a combined industrial and domestic collection system, several lift stations, a small laboratory and operations building, facultative lagoons, and a land application system. Except for the land application system, all of these facilities are currently in service.

Very little information was available on the composition of the wastewater generated at Holloman AFB. Therefore, AL was called upon to provide a characterization of the wastewater generated.

Permit Standards

The existing lagoons discharge to Lake Holloman via a natural ditch. Lake Holloman is a playa lake and is not considered "waters of the United States" by Region VI of the United States Environmental Protection Agency (EPA). Therefore, the discharge to Lake Holloman is not currently regulated under the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) program. Discussions with EPA Region VI officials, base personnel, and the New Mexico Environmental Improvement Division (EID), have indicated that, in the future, Lake Holloman may be classified as "waters of the United States." If this classification is granted, discharge of wastewater from Holloman AFB to Lake Holloman would be regulated under a NPDES permit.

Sampling Strategy

A presurvey was conducted at Holloman AFB from 12-13 June 1991. During this presurvey, the sampling protocol that had been developed by 1st Lt Curtis was reviewed by the Base Bioenvironmental Engineer (BEE) and the Environmental Coordinator. All parties concurred with the sampling strategy.

Sampling Methods

Wastewater samples were typically collected over a 24-h period as a time-proportional composite (i.e., a composite of 24 samples collected at 1-h intervals). The automated composite sampler contains a 3-gal (11.4-L) glass jar which was packed in ice before each day of sampling. Samples collected for volatile organics, oils and greases, and total petroleum hydrocarbons were collected as grab samples. Any unusual characteristics (odor, color, etc.) of the samples were noted.

Samples were then placed in iced coolers and transported back to the workcenter (Wastewater Treatment Plant Laboratory, Bldg 752) for preservation and/or refrigeration until shipment to the Armstrong Laboratory Analytical Services Division at Brooks AFB TX. Sample preservation was in accordance with the *Air Force Occupational and Environmental Health Laboratory (AFOEHL) Sampling Guide, March 1989*.

RESULTS

Results of all the data collected during the survey except for Biochemical Oxygen Demand (BOD), and Toxicity Characteristic Leaching Procedure (TCLP) are located in Appendix A. Appendix A also shows what method was used in the analytical process. Appendix B shows detectable parameters. Grab samples are shaded in Appendix B to separate them from composites. Biochemical Oxygen Demand data are included in Appendix B, and the TCLP data are included in Appendix F.

Sampling Sites

Table 1 shows grab and composite parameters. If a sample was collected differently from this method, it is noted in the comments section under each site. For some samples low flow resulted in part of a sample being a grab because of the limited volume.

TABLE 1. PARAMETERS, GROUP, GRAB/COMPOSITE, CONTAINERS, AND PRESERVATION

Parameter Name	Grab/Composite	Container	Preservation
GROUP A (other than O & G) Chemical Oxygen Demand Kjeldahl Nitrogen Organic Carbon Phosphorus, Total	**Composite**	Plastic	Cool to 4 °C & H_2SO_4 to pH<2
GROUP A (O & G) Oil & Grease Total Petroleum Hydrocarbons	**Grab**	Glass	Cool to 4 °C & H_2SO_4 to pH<2
GROUP E Phenols	**Composite**	Glass	Cool to 4 °C & H_2SO_4 to pH<2
GROUP F Metals	**Composite**	Plastic	HNO_3 to pH<2
Group G Alkalinity Chloride Specific Conductance Surfactant-MBAS Solids	**Composite**	Plastic	Cool to 4 °C
601/601	**Grab**	40 ml Vial	Cool to 4 °C

Sewage Treatment Plant (STP)

The sampler was located below the comminutor and before the grit chamber (Fig. 1) located by building 752, Appendix C, Figure C-3 (Tab G-2, page 3 of the

sanitary sewerage system prints at location CC-9). Samples were collected between 14-21 Aug 91.

Comments: 14 Aug 91, all samples were grab
17 Aug 91, milky sample
19 Aug 91, all samples were grab

<u>Sewage Treatment Plant (STP#)</u>

These samples were collected as 6-h composite samples. Table 2 has the time and date each sample was collected.

Figure 1. Location of Sampler STP and STP#.

TABLE 2. STP# COMPOSITE SAMPLING TIMES

Sample	Time	BOD mg/L
STP	Grab-1300 14 Aug 91	135
STP 1	600-2230 14 Aug 91	100
STP 2	2230-0800 15 Aug 91	55
STP 3	1030-1330 15 Aug 91	105
STP 4	1330-2000 15 Aug 91	150
STP 5	2000-0800 16 Aug 91	90
STP 6	0800-1000 16 Aug 91	95
STP 7	1230-1800 16 Aug 91	115

<u>Site 1</u>

Manhole 437: This site is located southwest of the main taxiway/runway access ramp, Appendix C, Figure C-3 (Tab G-2, page 3 of the sanitary sewerage system prints at location BB-9). Samples were collected on the 14th, 15th, and 16th of Aug 91.

Comments: 14 Aug 91, Group G grab
16 Aug 91, Group F grab

Site 2

Manhole 380: This site is located by billeting across West Eleventh Street from the softball fields, Appendix C, Figure C-3 (Tab G-2, page 3 of the sanitary sewerage system prints at location BB-11). Samples were collected on the 15th, 16th, and 20th of Aug 91.

Comments: 20 Aug 91, Groups F & E were grab

Site 3

Building 912 Lift Station: This site is a lift station adjacent to Building 912, Appendix C, Figure C-5 (Tab G-2, page 2 of the sanitary sewerage system prints at location CC-7). Samples were collected on the 15th, 16th, and 20th of Aug 91.

Site 4

Manhole 427: This site was located in the MOBSS Complex beside Building 927 and across from building 938, Appendix C, Figure C-5 (Tab G-2, page 2 of the sanitary sewerage system prints at location AA-7). The site was collected on 21 Aug 91.

Comments: Groups A, G, and E were grab

Site 5

Manhole 516: This site was located in the primate area, Rhesus Monkey, between buildings 262 and 267, Appendix C, Figure C-4 (Tab G-2, page 7 of the sanitary sewerage system prints at location Q-12). Samples were collected on the 16th, 20th, and 21st of Aug 91.

Comments: 16 Aug 91, very high solids observed
20 Aug 91, very high solids and hair observed

Site 6

Manhole 337: This site is located by Corrosion Control between buildings 281 and 282, Appendix C, Figure C-3 (Tab G-2, page 3 of the sanitary sewerage system prints). Samples were collected on the 16th, 20th, and 21st of Aug 91.

Comments: 16 Aug 91, Groups F and A were grab
20 Aug 91, Groups A, G, and E were grab

Lake

Lake Holloman: This site was located 50 m north of the concrete outfall to Lake Holloman, Appendix C, Figure C-1.

Comments: This sample was collected at the lake bank as a grab sample using a pitcher.

Discussion of Results

Appendix B shows a condensed version of the data taken at Holloman AFB. Select data will be discussed briefly in this section. Appendix A shows the data that was sent to HQ/TAC and the base during the writing of this report. Updated versions were sent out on three occasions with the last update being 18 Nov 91, 1 working day after the last data was received by the Bioenvironmental Engineering Division of AL (AL/OEB). These updates to HQ/TAC were an essential part of the project.

BOD, Solids, Chloride

Biochemical Oxygen Demand samples were collected at the wastewater treatment plant only, due to time and resource constraints. The BOD ranged from a low of 50 mg/L to a high of 150 mg/L. These results also agree with the contract labs data shown in Appendix D. This concentration constitutes a weak wastewater when compared to the values for BOD shown in Table 3.

The solids data from the STP show that the observed concentrations constitute a strong domestic waste when compared to Table 3. This data should be considered questionable because of discrepancies between filterable and total solids data. Some sites were found to have a higher filterable amount of solids than total solids which is in error. This error is most likely caused by the small-diameter filter paper and the small drying dishes used for the test at AL. Settleable solids data as seen in Table 4 are representative of a typical weak domestic waste when compared to cited values in Table 3.

Chloride concentrations in the wastewater seem to indicate an infiltration problem. Chloride sampling was initiated halfway through the survey at the request of the Environmental Coordinator to determine if possible infiltration is occurring. At the same time, a background water sample from the potable water system was taken to determine the amount of influence the chloride in the potable water source had on the wastewater. The potable background sample indicated that only 31 mg/L of chloride was in the drinking water. The WWTP influent had 900 mg/L chloride. Certain industrial facilities could also be contributing to the high chloride concentration.

TABLE 3. TYPICAL COMPOSITION OF UNTREATED DOMESTIC WASTEWATER (After Metcalf & Eddy, 1979(7))
(All values except settleable solids are expressed in mg/L)[a]

Constituent	Concentration		
	Strong	Medium	Weak
Solids, total:	1,200	720	350
Dissolved, total	850	500	250
Fixed	525	300	145
Volatile	325	200	105
Suspended, total	350	220	100
Fixed	75	55	20
Volatile	275	165	80
Settleable solids, ml/L	20	10	5
Biochemical oxygen demand, 5-day, 20°C	400	220	110
Total organic carbon (TOC)	290	160	80
Chemical oxygen demand (COD)	1,000	500	250
Nitrogen (total as N):	85	40	20
Organic	35	15	8
Free ammonia	50	25	12
Nitrites	0	0	0
Nitrates	0	0	0
Phosphorus (total as P):	15	8	4
Organic	5	3	1
Inorganic	10	5	3
Chlorides[b]	100	50	30
Alkalinity (as $CaCO_3$)[b]	200	100	50
Grease	150	100	50

[a] mg/L=g/m³.
[b] Values should be increased by amount in domestic water supply.
Note: 1.8(°C) + 32 = °F

TABLE 4. SETTLEABLE SOLIDS "GRAB SAMPLES" CONCENTRATIONS AT SITE LOCATION STP

Date	Time (hours)	Concentration (ml/L)
15 Aug 91	2000	5
16 Aug 91	0800	4
16 Aug 91	1230	4
17 Aug 91	0800	3
19 Aug 91	0750	9
20 Aug 91	0830	5

If effluent from the new WWTP is used for irrigation, different application methods should be considered because of the amount of chloride in the wastewater. Border-strip flooding or ridge-and-furrow irrigation would be recommended over a sprinkler

type system. Foliar absorption of chlorides must be considered if the sprinkler application method is used. Salt tolerance of ornamental shrubs is shown in Table 5.

Chloride concentrations over 3,750 mg/L were found in Lake Holloman. Sea water has 18,980 (ppm) of chloride. Please take into consideration that the sample was taken very close to the bank and the concentration could be higher at this point than at the center of the lake. But, realizing that the concentrations are high, irrigation from this source is strongly discouraged. Even if a salt tolerant plant is found that can thrive at these high levels, the irrigation piping will degrade and become unusable in a very short time.

TABLE 5. SALT TOLERANCE OF ORNAMENTAL SHRUBS (After CRC Press, 1973(2))

	Limit of concentration in irrigation water		
Shrub[a]	EC_e[b]	EC_w[c]	ppm[d]
Sensitive			
Roses	3,000	517	362
Pineapple guave	3,000	517	362
Viburnum	3,000	517	362
Moderately sensitive			
Pyracantha	5,000	1,000	700
Pittosporum	5,000	1,000	700
Xylosma	5,000	1,000	700
Texas prive	5,000	1,000	700
Moderately salt tolerant			
Arbor vitae	8,000	1,560	1,092
Spreading juniper	8,000	1,560	1,092
Lantana	8,000	1,560	1,092
Salt tolerant			
Oleander	10,000	2,000	1,400
Bottlebrush	10,000	2,000	1,400

[a] The indicated salt levels are the maximum tolerance by the U.S. Department of Agriculture.
[b] EC electrical conductivity of soil solution, umho/cm.
[c] Salinity of irrigation water required, as derived from author's table, assuming a 25% leaching requirement.
[d] Required irrigation water in ppm, using a conversion of 1 mho=770 ppm.

Sewage Treatment Plant and Sewage Treatment Plant

The composition of the influent to the STP does not resemble a "typical" domestic or industrial waste. The BOD and Chemical Oxygen Demand (COD) is more representative of a medium to weak domestic waste. The questionable solids data indicates a strong domestic waste. Trace amounts of silver were found at this site but the highest concentration is only 5 times the detectable amount. This diluted level may indicate a stronger source upstream, possibly the Hospital or the base Photo

Lab. Oil & Grease do not seem to be a major problem but its presence may indicate that a number of oil/water separators are not working properly.

Site 1, Site 2, and Site 4

The data received on these sites indicated that no apparent problems were occurring upstream from the sampling point.

Site 3

The 980 mg/L of chloride reported at this site could indicate an infiltration problem. Note, only 1 of the 3 sampling days was analyzed for chloride.

Site 5

Two sampling days were analyzed for chloride at this site. One day with 2,560 mg/L and the other day having a concentration of 720 mg/L of chloride. Again this level could indicate infiltration to the system upstream from Site 5. Oil & grease data indicates that there may be an oil/water separator upstream that is not working properly.

Site 6

One of the 3 *sampling* days at this site had 100,000 μg/L of phenol. Methylene chloride of 23,516 μg/L was also reported on that day. Toluene and chloroform were also found. This data indicates that proper shop practices may not be in use upstream from this site.

Lake

If Lake Holloman water is considered for irrigation, the 3,760 mg/L of chloride and the 18,650 umhos of specific conductance should be considered. Barium, nickel, and phenol were also found in the lake.

Flow

During the survey, flow measurements were taken at the WWTP's parshall flume. The calculations are shown in Appendix E for 1 of the 2 measurements taken. The average flow recorded by AL personnel was 863 gal/min (3,266 L/min). Holloman's electronic flow meter was reading 860 gal/min during the same period. These results indicate that the flow readings at the treatment plant should represent the correct flow even though flow is entering one side of the flume faster than the other side. This flow is due to the influent being channeled through only one side of the grit chamber. For this reason there is not a quiet area before the flume and an earlier concern was that this could possibly reduce the accuracy of the electronic flow meter. Our results

showed that this is not a problem at this flow rate; however, higher or lower flow rates may be effected because there is not an adequate quiet area before the flume.

RECOMMENDATIONS AND CONCLUSIONS

Sewage Treatment Plant

Since the data shows the BOD to be very low for domestic waste, an activated sludge treatment method would not meet the treatment objective. With all things considered, an oxidation ditch may prove to be the best treatment alternative.

Chlorides

Chloride levels above background were found throughout the collection system. This finding could indicate infiltration problems. But, with the chloride concentration of the surface ground water being high, it doesn't take very much infiltration to show up as chloride in the wastewater. Water from Lake Holloman should not be used in a sprinkler-type irrigation system.

Proper Shop Practice

Site 6 data indicates that proper shop practices may not be in use upstream from this site. *Unannounced* visits to these shops may also reveal improper housekeeping. A review of the shop's Operating Instructions (OIs) may be beneficial.

Flow

The AL flow calculations mirrored Holloman's electronic flow meter, at 860 gal/min (3,218 L/min). The flow wheels at the base should provide an accurate measure of the flow.

Wastewater Characterization

Holloman is now undergoing changes and will be bedding down the F-117 Stealth Fighter. The type of waste stream coming from the stealth flightline area of the base will most likely change. Since this type of waste stream hasn't been characterized before, Holloman may want to consider a study of that portion of the wastewater collection system.

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ACRONYMS

A & E	Architect and Engineer
AFB	Air Force Base
AFOEHL	Air Force Occupational and Environmental Health Laboratory
AL	Armstrong Laboratory (AL)
/OE	Occupational and Environmental Health Directorate (AL/OE)
B	Bioenvironmental Engineering Division (AL/OEB)
BEE	Bioenvironmental Engineer
BES	Bioenvironmental Engineering Services
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
EID	Environmental Improvement Division
EPA	Environmental Protection Agency
mg/L	Milligrams per Liter
HQ	Headquarters
MOBSS	Mobility Support Squadron
NM	New Mexico
NPDES	National Pollution Discharge Elimination System
ppm	Parts per Million
STP	Sewage Treatment Plant
TCLP	Toxicity Characteristic Leaching Procedure
TAC	Tactical Air Command
TFW	Tactical Fighter Wing
TTW	Tactical Training Wing
WWTP	Wastewater Treatment Plant

Appendix A

Analyzed Data

Figure A-1

			STP GN913000 14-Aug-91 0800 hrs	STP GN913002 15-Aug-91 0800 hrs	STP GN913010 16-Aug-91 0800 hrs	STP GN913022 17-Aug-91 0745 hrs	STP GN913023 18-Aug-91 0815 hrs	STP GN913024 19-Aug-91 0750 hrs	STP GN913025 20-Aug-91 0830 hrs	STP GN913026 21-Aug-91 0750 hrs
Phenol	ug/L	EPA 420.2	50	25	<10.0	180	20	31	20	20
Alkalinity (bicarbonate)	mg/L	EPA 310.1	•	•	•	•	•	•	311	278
Alkalinity (total)	mg/L	EPA 310.2	•	•	•	•	•	•	311	278
Chlorides	mg/L	EPA 325.2	•	•	•	•	•	•	860	910
Residue, Filterable	mg/L	EPA 160.1	3500	1300	3200	3400	3600	3100	3200	3100
Residue, Nonfilterable	mg/L	EPA 160.2	55	150	155	14	5	70	18	14
Residue, Settleable	ml/L	EPA 160.5	2	2	6	1	1	5	1	1
Residue, Total	mg/L	EPA 160.3	3900	4500	4200	4100	4100	3700	3500	3500
Residue, Total Volatile	mg/L	EPA 160.4	930	1300	910	870	660	770	600	750
Specific conductance	umhos	EPA 120.1	4700	4270	5000	4900	4900	4600	4420	4370
Surfactants-MBAS	mg/L	EPA 425.1	0.2	0.3	2.5	0.1	0.2	0.2	0.2	0.3
Chemical oxygen demand	mg/L	STDM 508C	200	110	360	140	223	385	220	215
Total organic carbon	mg/L	EPA 415.1	27	30	42	11	17	20	29	23
Oil & Grease	mg/L	EPA 413.2	19.6	97.6	82.4	4.0	4.3	62.4	54.8	40.0
Total hydrocarbons	mg/L	EPA 418.1	5.4	54.7	14.6	<1.0	<1.0	8.9	23.4	7.7
Kjeldahl nitrogen (total)	mg/L	EPA 351.2	10.5	12.0	7.0	8.3	8.5	12.5	20.5	19.0
Phosphorus (total)	mg/L	EPA 365.1	3.4	3.4	3.8	1.3	2.3	3.2	4.6	3.1
Arsenic	ug/L	EPA 206.2	<10.0	<10.0	11	<10.0	<10.0	11	<10.0	<10.0
Barium	ug/L	EPA 200.7	<1000	<1000	<1000	<1000	<1000	<1000	<100	130
Beryllium	ug/L	EPA 210.1	11	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	ug/L	EPA 213.1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<10.0
Calcium	mg/L	EPA 215.1	306	337	372	317	347	213	290	360
Chromium	ug/L	EPA 218.1	<20	<20	37	40	<20	24	<50	<50
Chromium VI	ug/L	EPA 218.4	<20	<20	•	•	<20	•	<50	<50
Copper	ug/L	EPA 220.1	52	31	160	151	128	207	<20	40
Iron	ug/L	EPA 236.1	549	653	3224	461	1680	878	270	480
Lead	ug/L	EPA 239.1	<20	<20	<20	<20	<20	<20	<20	<20
Magnesium	mg/L	EPA 242.1	162	149	152	172	162	162	140	170
Manganese	ug/L	EPA 243.1	97	87	133	111	222	98	100	100
Mercury	ug/L	EPA 245.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/L	EPA 249.1	<50	<50	<50	<50	<50	<50	<50	<50
Silver	ug/L	EPA 272.1	<10.0	10	52	29	18	20	<10.0	<10.0
Zinc	ug/L	EPA 289.1	<50	64	300	358	127	238	<50	<50
Potassium	mg/L	EPA 258.1	•	•	•	•	•	•	13	16
Sodium	mg/L	EPA 273.1	•	•	•	•	•	•	500	620
Bromodichloromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromoform	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Carbon Tetrachloride	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Chloroethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Chloroform	ug/L	EPA 601	0.62	0.75	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chloromethane	ug/L	EPA 601	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chlorodibromomethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 601	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 601	4.4	4.9	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Dichlorodifluoromethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,1-Dichloroethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-Dichloroethane	ug/L	EPA 601	1.9	4.0	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,1-Dichloroethene	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
trans-1,2-Dichloroethene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
cis-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	ug/L	EPA 601	30.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,1,2,2-Tetrachloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,1,1-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vinyl chloride	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Bromomethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
2-Chloroethylvinyl ether	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,3-Dichlorobenzene	ug/L	EPA 602	•	•	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 602	•	•	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethyl Benzene	ug/L	EPA 602	13.2	247	5.0	<0.3	<0.3	<0.3	<0.3	<0.3
Chlorobenzene	ug/L	EPA 602	<0.6	3.4	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Toluene	ug/L	EPA 602	26.7	360	11	<0.3	<0.3	<0.3	<0.3	<0.3
Benzene	ug/L	EPA 602	19.4	247	7.1	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 602	•	•	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Figure A-2

			STP #1 GN913006 14-Aug-91 2230 hrs	STP #2 GN913007 15-Aug-91 0800 hrs	STP #3 GN913008 15-Aug-91 1330 hrs	STP #4 GN913009 15-Aug-91 2000 hrs	STP #5 GN913016 16-Aug-91 0800 hrs	STP #6 GN913017 16-Aug-91 1000 hrs	STP #7 GN913021 16-Aug-91 1800 hrs
Phenol	ug/L	EPA 420.2	88	20	25	25	24	26	33
Alkalinity (bicarbonate)	mg/L	EPA 310.1	•	•	•	•	•	•	•
Alkalinity (total)	mg/L	EPA 310.2	•	•	•	•	•	•	•
Chlorides	mg/L	EPA 325.2	•	•	•	•	•	•	•
Residue, Filterable	mg/L	EPA 160.1	3600	4100	3100	3100	3200	3100	13000
Residue, Nonfilterable	mg/L	EPA 160.2	160	88	100	635	75	100	13
Residue, Settleable	ml/L	EPA 160.5	1	2	4	11	3	4	1
Residue, Total	mg/L	EPA 160.3	4200	5100	3700	4300	4300	880	3600
Residue, Total Volatile	mg/L	EPA 160.4	1100	1400	650	1100	690	175	665
Specific conductance	umhos	EPA 120.1	4030	4700	4600	4050	5200	4500	3700
Surfactants-MBAS	mg/L	EPA 425.1	0.3	0.2	1.5	2.7	0.7	0.2	1.0
Chemical oxygen demand	mg/L	STDM 508C	160	750	400	400	150	170	110
Total organic carbon	mg/L	EPA 415.1	26	23	35	40	21	38	31
Oil & Grease	mg/L	EPA 413.2	48.8	122.0	79.2	40.0	179.2	104.0	49.6
Total hydrocarbons	mg/L	EPA 418.1	4.3	78.0	9.7	14.0	34.2	44.2	2.6
Kjeldahl nitrogen (total)	mg/L	EPA 351.2	9.0	13.0	200.0	9.5	8.0	9.5	10.0
Phosphorus (total)	mg/L	EPA 365.1	3.7	3.7	4.1	3.5	3.4	5.3	3.6
Arsenic	ug/L	EPA 206.2	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Barium	ug/L	EPA 200.7	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Beryllium	ug/L	EPA 210.1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	ug/L	EPA 213.1	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0	<5.0
Calcium	mg/L	EPA 215.1	370	450	337	374	412	305	284
Chromium	ug/L	EPA 218.1	43	36	260	26	23	22	34
Chromium VI	ug/L	EPA 218.4	<20	<20	•	•	•	•	•
Copper	ug/L	EPA 220.1	88	71	305	454	156	92	40
Iron	ug/L	EPA 236.1	1335	191	3114	9930	1711	783	376
Lead	ug/L	EPA 239.1	21	<20	<20	<20	<20	<20	<20
Magnesium	mg/L	EPA 242.1	169	169	157	158	148	146	150
Manganese	ug/L	EPA 243.1	114	<50	155	161	140	106	102
Mercury	ug/L	EPA 245.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/L	EPA 249.1	<50	<50	181	<50	<50	<50	<50
Silver	ug/L	EPA 272.1	27	21	35	38	25	12	11
Zinc	ug/L	EPA 289.1	164	<50	400	621	243	<50	358
Potassium	mg/L	EPA 258.1	•	•	•	•	•	•	•
Sodium	mg/L	EPA 273.1	•	•	•	•	•	•	•
Bromodichloromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	5.7	13
Bromoform	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Carbon Tetrachloride	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Chloroethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Chloroform	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chloromethane	ug/L	EPA 601	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chlorodibromomethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 601	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Dichlorodifluoromethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,1-Dichloroethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-Dichloroethane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,1-Dichloroethene	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
trans-1,2-Dichloroethene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
cis-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,1,2,2-Tetrachloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,1,1-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vinyl chloride	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Bromomethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
2-Chloroethylvinyl ether	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,3-Dichlorobenzene	ug/L	EPA 602	•	•	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 602	•	•	<0.7	<0.7	<0.7	<0.7	<0.7
Ethyl Benzene	ug/L	EPA 602	19.7	271	10	8.5	5.7	144	5.5
Chlorobenzene	ug/L	EPA 602	<0.6	3.5	<0.6	<0.6	<0.6	<0.6	<0.6
Toluene	ug/L	EPA 602	65.2	352	31	52	14	553	17
Benzene	ug/L	EPA 602	63.1	256	23	27	8.8	174	14
1,2-Dichlorobenzene	ug/L	EPA 602	•	•	<1.0	<1.0	<1.0	<1.0	<1.0

Figure A-3

			Site 1 GN913001 14-Aug-91 0820 hrs	Site 1 GN913003 15-Aug-91 0822 hrs	Site 1 GN913011 16-Aug-91 0822 hrs	Site 2 GN913004 15-Aug-91 0800 hrs	Site 2 GN913012 16-Aug-91 0855 hrs	Site 2 GN913027 20-Aug-91 0835 hrs
Phenol	ug/L	EPA 420.2	29	15	15	29	22	<10.0
Alkalinity (bicarbonate)	mg/L	EPA 310.1	•	•	•	•	•	•
Alkalinity (total)	mg/L	EPA 310.2	•	•	•	•	•	•
Chlorides	mg/L	EPA 325.2	•	•	•	•	•	210
Residue, Filterable	mg/L	EPA 160.1	1400	2100	3600	1300	1100	1030
Residue, Nonfilterable	mg/L	EPA 160.2	7	12	20	50	35	110
Residue, Settleable	ml/L	EPA 160.5	2	0.3	0.4	0.3	1.5	2.5
Residue, Total	mg/L	EPA 160.3	1500	2300	2200	1400	1400	1400
Residue, Total Volatile	mg/L	EPA 160.4	280	530	660	300	220	330
Specific conductance	umhos	EPA 120.1	1580	2900	2240	1609	1910	1820
Surfactants-MBAS	mg/L	EPA 425.1	0.2	0.3	0.3	0.2	1.7	0.3
Chemical oxygen demand	mg/L	STDM 508C	160	65	110	95	165	214
Total organic carbon	mg/L	EPA 415.1	40	17	26	28	31	71
Oil & Grease	mg/L	EPA 413.2	4.0	2.2	8.2	40.0	42.8	97.6
Total hydrocarbons	mg/L	EPA 418.1	1.3	1.3	3.7	4.5	2.6	19.5
Kjeldahl nitrogen (total)	mg/L	EPA 351.2	22.0	8.0	13.5	14.0	17.5	20.0
Phosphorus (total)	mg/L	EPA 365.1	4.6	1.2	1.9	3.6	4.7	5.6
Arsenic	ug/L	EPA 206.2	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Barium	ug/L	EPA 200.7	<1000	<1000	<1000	<1000	<1000	<100
Beryllium	ug/L	EPA 210.1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	ug/L	EPA 213.1	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0
Calcium	mg/L	EPA 215.1	235	377	347	161	243	140
Chromium	ug/L	EPA 218.1	<20	<20	45	<20	<20	<50
Chromium VI	ug/L	EPA 218.4	<20	<20	•	<20	<20	<50
Copper	ug/L	EPA 220.1	44	<20	157	97	179	<20
Iron	ug/L	EPA 236.1	790	168	1098	385	137	3200
Lead	ug/L	EPA 239.1	<20	<20	<20	<20	<20	<20
Magnesium	mg/L	EPA 242.1	29	34	47	46	89	51
Manganese	ug/L	EPA 243.1	99	96	234	<50	78	90
Mercury	ug/L	EPA 245.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/L	EPA 249.1	<50	<50	150	<50	<50	<50
Silver	ug/L	EPA 272.1	23	10	10	36	<10.0	<10.0
Zinc	ug/L	EPA 289.1	95	<50	291	77	585	180
Potassium	mg/L	EPA 258.1	•	•	•	•	•	10
Sodium	mg/L	EPA 273.1	•	•	•	•	•	130
Bromodichloromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromoform	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Carbon Tetrachloride	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Chloroethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Chloroform	ug/L	EPA 601	<0.3	<0.3	<0.3	0.85	<0.3	<0.3
Chloromethane	ug/L	EPA 601	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chlorodibromomethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 601	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 601	<0.7	1.8	<0.7	6.6	<0.7	<0.7
Dichlorodifluoromethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,1-Dichloroethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-Dichloroethane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,1-Dichloroethene	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
trans-1,2-Dichloroethene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
cis-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	ug/L	EPA 601	24.5	10.7	<0.4	<0.4	<0.4	<0.4
1,1,2,2-Tetrachloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,1,1-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vinyl chloride	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Bromomethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
2-Chloroethylvinyl ether	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,3-Dichlorobenzene	ug/L	EPA 602	<0.5	<0.5	<0.5	•	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 602	<0.7	<0.7	<0.7	•	<0.7	<0.7
Ethyl Benzene	ug/L	EPA 602	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chlorobenzene	ug/L	EPA 602	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Toluene	ug/L	EPA 602	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Benzene	ug/L	EPA 602	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 602	<1.0	<1.0	<1.0	•	<1.0	<1.0

Figure A-4

			Site 3 GN913005 15-Aug-91 0815 hrs	Site 3 GN913013 16-Aug-91 0835 hrs	Site 3 GN913028 20-Aug-91 0850 hrs	Site 4 GN913034 21-Aug-91 0920 hrs	Blank GN913035 21-Aug-91	Tap Water GN913036 21-Aug-91	Lake GN913031 20-Aug-91 1400 hrs
Phenol	ug/L	EPA 420.2	18	36	47	22	<10.0	<10.0	170
Alkalinity (bicarbonate)	mg/L	EPA 310.1	*	*	*	*	7	195	*
Alkalinity (total)	mg/L	EPA 310.2	*	*	*	*	7	195	*
Chlorides	mg/L	EPA 325.2	*	*	980	300	<1.0	31	3760
Residue, Filterable	mg/L	EPA 160.1	3300	4100	4100	1400	<1.0	460	7700
Residue, Nonfilterable	mg/L	EPA 160.2	10	5	3	18	<1.0	<1.0	110
Residue, Settleable	ml/L	EPA 160.5	0.2	0.2	0.4	0.2	<0.2	<0.2	1.5
Residue, Total	mg/L	EPA 160.3	3700	4500	4700	1700	30	530	8400
Residue, Total Volatile	mg/L	EPA 160.4	830	800	1100	350	27	110	3600
Specific conductance	umhos	EPA 120.1	4090	5450	5260	2230	1	723	18650
Surfactants-MBAS	mg/L	EPA 425.1	0.2	0.2	0.1	0.1	<0.1	<0.1	0.9
Chemical oxygen demand	mg/L	STDM 508C	100	105	62	84	<10.0	<10.0	520
Total organic carbon	mg/L	EPA 415.1	13	13	12	33	5	2	66
Oil & Grease	mg/L	EPA 413.2	3.7	4.0	2.4	6.7	0.6	0.5	7.9
Total hydrocarbons	mg/L	EPA 418.1	1.9	1.1	<1.0	1.3	<1.0	<1.0	1.7
Kjeldahl nitrogen (total)	mg/L	EPA 351.2	4.5	6.5	5.9	18.0	0.6	0.5	7.5
Phosphorus (total)	mg/L	EPA 365.1	0.7	5.3	0.6	1.6	<0.1	<0.1	0.8
Arsenic	ug/L	EPA 206.2	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	10
Barium	ug/L	EPA 200.7	<1000	<1000	<100	<10.0	<10.0	<10.0	140
Beryllium	ug/L	EPA 210.1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	ug/L	EPA 213.1	<5.0	<5.0	<10.0	<10.0	<10.0	<10.0	<10.0
Calcium	mg/L	EPA 215.1	410	552	390	150	<0.1	76	940
Chromium	ug/L	EPA 218.1	26	21	<50	<50	<50	<50	<50
Chromium VI	ug/L	EPA 218.4	<20	*	<50	<50	<50	<50	<50
Copper	ug/L	EPA 220.1	*	162	40	30	<20	100	70
Iron	ug/L	EPA 236.1	361	474	190	260	100	110	220
Lead	ug/L	EPA 239.1	54	<20	<20	<20	<20	<20	<20
Magnesium	mg/L	EPA 242.1	121	170	170	83	<0.1	26	670
Manganese	ug/L	EPA 243.1	74	126	100	60	<50	<50	110
Mercury	ug/L	EPA 245.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/L	EPA 249.1	<50	370	<50	<50	<50	<50	170
Silver	ug/L	EPA 272.1	27	20	<10.0	<10.0	<10.0	<10.0	<10.0
Zinc	ug/L	EPA 289.1	161	370	<50	<50	<50	<50	<50
Potassium	mg/L	EPA 258.1	*	*	17	4	<0.1	3	*
Sodium	mg/L	EPA 273.1	*	*	600	230	<0.1	67	2300
Bromodichloromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	1.3	<0.4
Bromoform	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	<0.7	7.0	<0.7
Carbon Tetrachloride	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Chloroethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Chloroform	ug/L	EPA 601	0.52	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chloromethane	ug/L	EPA 601	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chlorodibromomethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	3.1	<0.5
1,2-Dichlorobenzene	ug/L	EPA 601	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Dichlorodifluoromethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,1-Dichloroethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-Dichloroethane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,1-Dichloroethene	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
trans-1,2-Dichloroethene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
cis-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	ug/L	EPA 601	11.7	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,1,2,2-Tetrachloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,1,1-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	EPA 601	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vinyl chloride	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Bromomethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
2-Chloroethylvinyl ether	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,3-Dichlorobenzene	ug/L	EPA 602	*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 602	*	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Ethyl Benzene	ug/L	EPA 602	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chlorobenzene	ug/L	EPA 602	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Toluene	ug/L	EPA 602	1.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Benzene	ug/L	EPA 602	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 602	*	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Figure A-5

			Site 5 GN913014 16-Aug-91 0855 hrs	Site 5 GN913029 20-Aug-91 0815 hrs	Site 5 GN913032 21-Aug-91 0820 hrs	Site 6 GN913015 16-Aug-91 0910 hrs	Site 6 GN913030 20-Aug-91 1030 hrs	Site 6 GN913033 21-Aug-91 0855 hrs
Phenol	ug/L	EPA 420.2	98	302	144	386	100000	11750
Alkalinity (bicarbonate)	mg/L	EPA 310.1	*	*	*	*	*	*
Alkalinity (total)	mg/L	EPA 310.2	*	*	*	*	*	*
Chlorides	mg/L	EPA 325.2	*	2560	720	*	87	85
Residue, Filterable	mg/L	EPA 160.1	2500	2100	1900	370	1150	590
Residue, Nonfilterable	mg/L	EPA 160.2	650	230	415	140	15	110
Residue, Settleable	ml/L	EPA 160.5	9.8	9.9	19.4	3.0	29.0	6.7
Residue, Total	mg/L	EPA 160.3	1900	6400	3400	930	1400	1400
Residue, Total Volatile	mg/L	EPA 160.4	640	6500	1000	280	700	720
Specific conductance	umhos	EPA 120.1	2840	9910	3620	1410	1540	1440
Surfactants-MBAS	mg/L	EPA 425.1	0.2	1.0	0.3	0.5	0.9	0.6
Chemical oxygen demand	mg/L	STDM 508C	280	300	61	305	3270	500
Total organic carbon	mg/L	EPA 415.1	87	63	152	75	555	158
Oil & Grease	mg/L	EPA 413.2	256	86.4	800	159.1	76.0	73.2
Total hydrocarbons	mg/L	EPA 418.1	<1.0	5.1	31.7	36.9	54.8	10.4
Kjeldahl nitrogen (total)	mg/L	EPA 351.2	39.0	30.5	56.0	47.5	54.0	46.0
Phosphorus (total)	mg/L	EPA 365.1	14.0	18.2	57.0	5.2	1.6	10.4
Arsenic	ug/L	EPA 206.2	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Barium	ug/L	EPA 200.7	<100	300	280	<1000	<100	100
Beryllium	ug/L	EPA 210.1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium	ug/L	EPA 213.1	<5.0	<10.0	20	44	<10.0	<10.0
Calcium	mg/L	EPA 215.1	89	290	84	93	100	110
Chromium	ug/L	EPA 218.1	<20	<50	<50	164	70	<50
Chromium VI	ug/L	EPA 218.4	<20	<50	<50	*	*	<50
Copper	ug/L	EPA 220.1	171	90	<100	330	40	80
Iron	ug/L	EPA 236.1	2077	6100	5400	17590	9400	1400
Lead	ug/L	EPA 239.1	<20	31	100	56	37	<20
Magnesium	mg/L	EPA 242.1	23	48	39	31	27	37
Manganese	ug/L	EPA 243.1	434	690	1300	207	90	100
Mercury	ug/L	EPA 245.1	13	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/L	EPA 249.1	<50	60	60	<50	50	<50
Silver	ug/L	EPA 272.1	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Zinc	ug/L	EPA 289.1	1755	3400	<50	593	270	230
Potassium	mg/L	EPA 258.1	*	32	40	*	18	39
Sodium	mg/L	EPA 273.1	*	1600	840	*	82	120
Bromodichloromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromoform	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Carbon Tetrachloride	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ug/L	EPA 601	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Chloroethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Chloroform	ug/L	EPA 601	<0.3	<0.3	4.9	<0.3	1479	<0.3
Chloromethane	ug/L	EPA 601	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chlorodibromomethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 601	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 601	<0.7	<0.7	<0.7	<0.7	8.6	13
Dichlorodifluoromethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,1-Dichloroethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-Dichloroethane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
1,1-Dichloroethene	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
trans-1,2-Dichloroethene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ug/L	EPA 601	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
cis-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	ug/L	EPA 601	<0.4	<0.4	<0.4	48	23516	<0.4
1,1,2,2-Tetrachloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L	EPA 601	56	<0.6	<0.6	<0.6	870	<0.6
1,1,1-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	EPA 601	<0.5	<0.5	<0.5	<0.5	114	<0.5
Trichlorofluoromethane	ug/L	EPA 601	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vinyl chloride	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Bromomethane	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
2-Chloroethylvinyl ether	ug/L	EPA 601	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,3-Dichlorobenzene	ug/L	EPA 602	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ug/L	EPA 602	<0.7	<0.7	<0.7	<0.7	21	17
Ethyl Benzene	ug/L	EPA 602	<0.3	<0.3	<0.3	<0.3	20	<0.3
Chlorobenzene	ug/L	EPA 602	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Toluene	ug/L	EPA 602	28	<0.3	<0.3	<0.3	891	<0.3
Benzene	ug/L	EPA 602	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ug/L	EPA 602	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Appendix B

Detectable Data

Figure B-1

Sewage Treatment Plant (STP): The sampler was located below the comminutor and before the grit chamber located by building 752.		STP	STP	STP	STP
		GN913000	GN913002	GN913010	GN913022
		14-Aug-91	15-Aug-91	16-Aug-91	17-Aug-91
		0800 hrs	0800 hrs	0800 hrs	0745 hrs
BOD	mg/L	50	85	115	75
Phenol	ug/L	50	25	<10.0	180
Alkalinity (bicarbonate)	mg/L	*	*	*	*
Alkalinity (total)	mg/L	*	*	*	*
Chlorides	mg/L	*	*	*	*
Residue, Filterable	mg/L	3500	1300	3200	3400
Residue, Nonfilterable	mg/L	55	150	155	14
Residue, Settleable	ml/L	2	2	6	1
Residue, Total	mg/L	3900	4500	4200	4100
Residue, Total Volatile	mg/L	930	1300	910	870
Specific conductance	umhos	4700	4270	5000	4900
Surfactants-MBAS	mg/L	0.2	0.3	2.5	0.1
Chemical oxygen demand	mg/L	200	110	360	140
Total organic carbon	mg/L	27	30	42	11
Oil & Grease	mg/L	19.6	97.6	82.4	4.0
Total hydrocarbons	mg/L	5.4	54.7	14.6	<1.0
Kjeldahl nitrogen (total)	mg/L	10.5	12.0	7.0	8.3
Phosphorus (total)	mg/L	3.4	3.4	3.8	1.3
Calcium	mg/L	306	337	372	317
Copper	ug/L	52	31	160	151
Iron	ug/L	549	653	3224	461
Magnesium	mg/L	162	149	152	172
Manganese	ug/L	97	87	133	111
Silver	ug/L	<10.0	10	52	29
Zinc	ug/L	<50	64	300	358
Potassium	mg/L	*	*	*	*
Sodium	mg/L	*	*	*	*
Chloroform	ug/L	0.62	0.75	<0.3	<0.3
1,4-Dichlorobenzene	ug/L	4.4	4.9	<0.7	<0.7
1,2-Dichloroethane	ug/L	1.9	4.0	<0.3	<0.3
Methylene chloride	ug/L	30.2	<0.4	<0.4	<0.4
Ethyl Benzene	ug/L	13.2	247	5.0	<0.3
Chlorobenzene	ug/L	<0.6	3.4	<0.6	<0.6
Toluene	ug/L	26.7	360	11	<0.3
Benzene	ug/L	19.4	247	7.1	<0.5

Composite	Grab

Figure B-2

Sewage Treatment Plant (STP): The sampler was located below the comminutor and before the grit chamber located by building 752.		STP	STP	STP	STP
		GN913023	GN913024	GN913025	GN913026
		18-Aug-91	19-Aug-91	20-Aug-91	21-Aug-91
		0815 hrs	0750 hrs	0830 hrs	0750 hrs
BOD	mg/L	*	*	*	*
Phenol	ug/L	20	31	20	20
Alkalinity (bicarbonate)	mg/L	*	*	311	278
Alkalinity (total)	mg/L	*	*	311	278
Chlorides	mg/L	*	*	860	910
Residue, Filterable	mg/L	3600	3100	3200	3100
Residue, Nonfilterable	mg/L	5	70	18	14
Residue, Settleable	ml/L	1	5	1	1
Residue, Total	mg/L	4100	3700	3500	3500
Residue, Total Volatile	mg/L	660	770	600	750
Specific conductance	umhos	4900	4600	4420	4370
Surfactants-MBAS	mg/L	0.2	0.2	0.2	0.3
Chemical oxygen demand	mg/L	223	385	220	215
Total organic carbon	mg/L	17	20	29	23
Oil & Grease	mg/L	4.3	62.4	54.8	40.0
Total hydrocarbons	mg/L	<1.0	8.9	23.4	7.7
Kjeldahl nitrogen (total)	mg/L	8.5	12.5	20.5	19.0
Phosphorus (total)	mg/L	2.3	3.2	4.6	3.1
Calcium	mg/L	347	213	290	360
Copper	ug/L	128	207	<20	40
Iron	ug/L	1680	878	270	480
Magnesium	mg/L	162	162	140	170
Manganese	ug/L	222	98	100	100
Silver	ug/L	18	20	<10.0	<10.0
Zinc	ug/L	127	238	<50	<50
Potassium	mg/L	*	*	13	16
Sodium	mg/L	*	*	500	620
Chloroform	ug/L	<0.3	<0.3	<0.3	<0.3
1,4-Dichlorobenzene	ug/L	<0.7	<0.7	<0.7	<0.7
1,2-Dichloroethane	ug/L	<0.3	<0.3	<0.3	<0.3
Methylene chloride	ug/L	<0.4	<0.4	<0.4	<0.4
Ethyl Benzene	ug/L	<0.3	<0.3	<0.3	<0.3
Chlorobenzene	ug/L	<0.6	<0.6	<0.6	<0.6
Toluene	ug/L	<0.3	<0.3	<0.3	<0.3
Benzene	ug/L	<0.5	<0.5	<0.5	<0.5

Composite	Grab

Figure B-3

Sewage Treament Plant (STP#): The sampler was located below the comminutor and before the grit chamber located by building 752.		STP #1	STP #2	STP #3	STP #4
		GN913006	GN913007	GN913008	GN913009
		14-Aug-91	15-Aug-91	15-Aug-91	15-Aug-91
		2230 hrs	0800 hrs	1330 hrs	2000 hrs
BOD	mg/L	100	55	105	150
Phenol	ug/L	88	20	25	25
Alkalinity (bicarbonate)	mg/L	*	*	*	*
Alkalinity (total)	mg/L	*	*	*	*
Chlorides	mg/L	*	*	*	*
Residue, Filterable	mg/L	3600	4100	3100	3100
Residue, Nonfilterable	mg/L	160	88	100	635
Residue, Settleable	ml/L	1	2	4	11
Residue, Total	mg/L	4200	5100	3700	4300
Residue, Total Volatile	mg/L	1100	1400	650	1100
Specific conductance	umhos	4030	4700	4600	4050
Surfactants-MBAS	mg/L	0.3	0.2	1.5	2.7
Chemical oxygen demand	mg/L	160	750	400	400
Total organic carbon	mg/L	26	23	35	40
Oil & Grease	mg/L	48.8	122.0	79.2	40.0
Total hydrocarbons	mg/L	4.3	78.0	9.7	14.0
Kjeldahl nitrogen (total)	mg/L	9.0	13.0	200.0	9.5
Phosphorus (total)	mg/L	3.7	3.7	4.1	3.5
Calcium	mg/L	370	450	337	374
Chromium	ug/L	43	36	260	26
Copper	ug/L	88	71	305	454
Iron	ug/L	1335	191	3114	9930
Magnesium	mg/L	169	169	157	158
Manganese	ug/L	114	<50	155	161
Nickel	ug/L	<50	<50	181	<50
Silver	ug/L	27	21	35	38
Zinc	ug/L	164	<50	400	621
Bromodichloromethane	ug/L	<0.4	<0.4	<0.4	<0.4
Ethyl Benzene	ug/L	19.7	271	10	8.5
Chlorobenzene	ug/L	<0.6	3.5	<0.6	<0.6
Toluene	ug/L	65.2	352	31	52
Benzene	ug/L	63.1	256	23	27

Composite	Grab

Figure B-4

Sewage Treament Plant (STP#): The sampler was located below the comminutor and before the grit chamber located by building 752.		STP #5	STP #6	STP #7
		GN913016	GN913017	GN913021
		16-Aug-91	16-Aug-91	16-Aug-91
		0800 hrs	1000 hrs	1800 hrs
BOD	mg/L	90	95	115
Phenol	ug/L	24	26	33
Alkalinity (bicarbonate)	mg/L	*	*	*
Alkalinity (total)	mg/L	*	*	*
Chlorides	mg/L	*	*	*
Residue, Filterable	mg/L	3200	3100	13000
Residue, Nonfilterable	mg/L	75	100	13
Residue, Settleable	ml/L	3	4	1
Residue, Total	mg/L	4300	880	3600
Residue, Total Volatile	mg/L	690	175	665
Specific conductance	umhos	5200	4500	3700
Surfactants-MBAS	mg/L	0.7	0.2	1.0
Chemical oxygen demand	mg/L	150	170	110
Total organic carbon	mg/L	21	38	31
Oil & Grease	mg/L	179.2	104.0	49.6
Total hydrocarbons	mg/L	34.2	44.2	2.6
Kjeldahl nitrogen (total)	mg/L	8.0	9.5	10.0
Phosphorus (total)	mg/L	3.4	5.3	3.6
Calcium	mg/L	412	305	284
Chromium	ug/L	23	22	34
Copper	ug/L	156	92	40
Iron	ug/L	1711	783	376
Magnesium	mg/L	148	146	150
Manganese	ug/L	140	106	102
Nickel	ug/L	<50	<50	<50
Silver	ug/L	25	12	11
Zinc	ug/L	243	<50	358
Bromodichloromethane	ug/L	<0.4	5.7	13
Ethyl Benzene	ug/L	5.7	144	5.5
Chlorobenzene	ug/L	<0.6	<0.6	<0.6
Toluene	ug/L	14	553	17
Benzene	ug/L	8.8	174	14

Composite	Grab

Figure B-5

Manhole 437: This site is located southwest of the main taxiway/runway access.		Site 1	Site 1	Site 1
		GN913001	GN913003	GN913011
		14-Aug-91	15-Aug-91	16-Aug-91
		0820 hrs	0822 hrs	0822 hrs
Phenol	ug/L	29	15	15
Residue, Filterable	mg/L	1400	2100	3600
Residue, Nonfilterable	mg/L	7	12	20
Residue, Settleable	ml/L	2	0.3	0.4
Residue, Total	mg/L	1500	2300	2200
Residue, Total Volatile	mg/L	280	530	660
Specific conductance	umhos	1580	2900	2240
Surfactants-MBAS	mg/L	0.2	0.3	0.3
Chemical oxygen demand	mg/L	160	65	110
Total organic carbon	mg/L	40	17	26
Oil & Grease	mg/L	4.0	2.2	8.2
Total hydrocarbons	mg/L	1.3	1.3	3.7
Kjeldahl nitrogen (total)	mg/L	22.0	8.0	13.5
Phosphorus (total)	mg/L	4.6	1.2	1.9
Calcium	mg/L	235	377	347
Chromium	ug/L	<20	<20	45
Copper	ug/L	44	<20	157
Iron	ug/L	790	168	1098
Magnesium	mg/L	29	34	47
Manganese	ug/L	99	96	234
Nickel	ug/L	<50	<50	150
Silver	ug/L	23	10	10
Zinc	ug/L	95	<50	291
1,4-Dichlorobenzene	ug/L	<0.7	1.8	<0.7
Methylene chloride	ug/L	24.5	10.7	<0.4

Composite	Grab

Figure B-6

Manhole 380: This site is located by billeting across West Eleventh Street from the softball fields.		Site 2	Site 2	Site 2
		GN913004	GN913012	GN913027
		15-Aug-91	16-Aug-91	20-Aug-91
		0800 hrs	0855 hrs	0835 hrs
Phenol	ug/L	29	22	<10.0
Chlorides	mg/L	*	*	210
Residue, Filterable	mg/L	1300	1100	1030
Residue, Nonfilterable	mg/L	50	35	110
Residue, Settleable	ml/L	0.3	1.5	2.5
Residue, Total	mg/L	1400	1400	1400
Residue, Total Volatile	mg/L	300	220	330
Specific conductance	umhos	1609	1910	1820
Surfactants-MBAS	mg/L	0.2	1.7	0.3
Chemical oxygen demand	mg/L	95	165	214
Total organic carbon	mg/L	28	31	71
Oil & Grease	mg/L	40.0	42.8	97.6
Total hydrocarbons	mg/L	4.5	2.6	19.5
Kjeldahl nitrogen (total)	mg/L	14.0	17.5	20.0
Phosphorus (total)	mg/L	3.6	4.7	5.6
Calcium	mg/L	161	243	140
Copper	ug/L	97	179	<20
Iron	ug/L	385	137	3200
Magnesium	mg/L	46	89	51
Manganese	ug/L	<50	78	90
Silver	ug/L	36	<10.0	<10.0
Zinc	ug/L	77	585	180
Potassium	mg/L	*	*	10
Sodium	mg/L	*	*	130
Chloroform	ug/L	0.85	<0.3	<0.3
1,4-Dichlorobenzene	ug/L	6.6	<0.7	<0.7

Composite	Grab

Figure B-7

Building 912 Lift Station: This site was the lift station outside of building 912.		Site 3	Site 3	Site 3
		GN913005	GN913013	GN913028
		15-Aug-91	16-Aug-91	20-Aug-91
		0815 hrs	0835 hrs	0850 hrs
Phenol	ug/L	18	36	47
Chlorides	mg/L	*	*	980
Residue, Filterable	mg/L	3300	4100	4100
Residue, Nonfilterable	mg/L	10	5	3
Residue, Settleable	ml/L	0.2	0.2	0.4
Residue, Total	mg/L	3700	4500	4700
Residue, Total Volatile	mg/L	830	800	1100
Specific conductance	umhos	4090	5450	5260
Surfactants-MBAS	mg/L	0.2	0.2	0.1
Chemical oxygen demand	mg/L	100	105	62
Total organic carbon	mg/L	13	13	12
Oil & Grease	mg/L	3.7	4.0	2.4
Total hydrocarbons	mg/L	1.9	1.1	<1.0
Kjeldahl nitrogen (total)	mg/L	4.5	6.5	5.9
Phosphorus (total)	mg/L	0.7	5.3	0.6
Calcium	mg/L	410	552	390
Chromium	ug/L	26	21	<50
Copper	ug/L	*	162	40
Iron	ug/L	361	474	190
Lead	ug/L	54	<20	<20
Magnesium	mg/L	121	170	170
Manganese	ug/L	74	126	100
Nickel	ug/L	<50	370	<50
Silver	ug/L	27	20	<10.0
Zinc	ug/L	161	370	<50
Potassium	mg/L	*	*	17
Sodium	mg/L	*	*	600
Methylene chloride	ug/L	11.7	<0.4	<0.4
Trichloroethylene	ug/L	2.7	<0.5	<0.5
Toluene	ug/L	1.3	<0.3	<0.3

Composite	Grab

Figure B-8

Manhole 427: Site 4 was located in the MOBSS Complex beside building 938. Lake Holloman: 50 meters from the concrete piped outfall		Site 4	Blank	Tap Water	Lake
		GN913034	GN913035	GN913036	GN913031
		21-Aug-91	21-Aug-91	21-Aug-91	20-Aug-91
		0920 hrs			1400 hrs
Phenol	ug/L	22	<10.0	<10.0	170
Alkalinity (bicarbonate)	mg/L	*	7	195	*
Alkalinity (total)	mg/L	*	7	195	*
Chlorides	mg/L	300	<1.0	31	3760
Residue, Filterable	mg/L	1400	<1.0	460	7700
Residue, Nonfilterable	mg/L	18	<1.0	<1.0	110
Residue, Settleable	ml/L	0.2	<0.2	<0.2	1.5
Residue, Total	mg/L	1700	30	530	8400
Residue, Total Volatile	mg/L	350	27	110	3600
Specific conductance	umhos	2230	1	723	18650
Surfactants-MBAS	mg/L	0.1	<0.1	<0.1	0.9
Chemical oxygen demand	mg/L	84	<10.0	<10.0	520
Total organic carbon	mg/L	33	5	2	66
Oil & Grease	mg/L	6.7	0.6	0.5	7.9
Total hydrocarbons	mg/L	1.3	<1.0	<1.0	1.7
Kjeldahl nitrogen (total)	mg/L	18.0	0.6	0.5	7.5
Phosphorus (total)	mg/L	1.6	<0.1	<0.1	0.8
Arsenic	ug/L	<10.0	<10.0	<10.0	10
Barium	ug/L	<10.0	<10.0	<10.0	140
Calcium	mg/L	150	<0.1	76	940
Copper	ug/L	30	<20	100	70
Iron	ug/L	260	100	110	220
Magnesium	mg/L	83	<0.1	26	670
Manganese	ug/L	60	<50	<50	110
Nickel	ug/L	<50	<50	<50	170
Potassium	mg/L	4	<0.1	3	*
Sodium	mg/L	230	<0.1	67	2300
Bromodichloromethane	ug/L	<0.4	<0.4	1.3	<0.4
Bromoform	ug/L	<0.7	<0.7	7.0	<0.7

Composite	Grab

Figure B-9

Manhole 516: This site was located in the primate area between buildings 262 and 267.		Site 5 GN913014 16-Aug-91 0855 hrs	Site 5 GN913029 20-Aug-91 0815 hrs	Site 5 GN913032 21-Aug-91 0820 hrs
Phenol	ug/L	98	302	144
Chlorides	mg/L	*	2560	720
Residue, Filterable	mg/L	2500	2100	1900
Residue, Nonfilterable	mg/L	650	230	415
Residue, Settleable	ml/L	9.8	9.9	19.4
Residue, Total	mg/L	1900	6400	3400
Residue, Total Volatile	mg/L	640	6500	1000
Specific conductance	umhos	2840	9910	3620
Surfactants-MBAS	mg/L	0.2	1.0	0.3
Chemical oxygen demand	mg/L	280	300	61
Total organic carbon	mg/L	87	63	152
Oil & Grease	mg/L	256	86.4	800
Total hydrocarbons	mg/L	<1.0	5.1	31.7
Kjeldahl nitrogen (total)	mg/L	39.0	30.5	56.0
Phosphorus (total)	mg/L	14.0	18.2	57.0
Barium	ug/L	<100	300	280
Beryllium	ug/L	<10.0	<10.0	<10.0
Cadmium	ug/L	<5.0	<10.0	20
Calcium	mg/L	89	290	84
Copper	ug/L	171	90	<100
Iron	ug/L	2077	6100	5400
Lead	ug/L	<20	31	100
Magnesium	mg/L	23	48	39
Manganese	ug/L	434	690	1300
Mercury	ug/L	13	<1.0	<1.0
Nickel	ug/L	<50	60	60
Zinc	ug/L	1755	3400	<50
Potassium	mg/L	*	32	40
Sodium	mg/L	*	1600	840
Chloroform	ug/L	<0.3	<0.3	4.9
Tetrachloroethylene	ug/L	56	<0.6	<0.6
Toluene	ug/L	28	<0.3	<0.3

Composite	Grab

Figure B-10

Manhole 337: This site is located by corrosion control between buildings 281 and 282.		Site 6 GN913015 16-Aug-91 0910 hrs	Site 6 GN913030 20-Aug-91 1030 hrs	Site 6 GN913033 21-Aug-91 0855 hrs
Phenol	ug/L	386	100000	11750
Chlorides	mg/L	*	87	85
Residue, Filterable	mg/L	370	1150	590
Residue, Nonfilterable	mg/L	140	15	110
Residue, Settleable	ml/L	3.0	29.0	6.7
Residue, Total	mg/L	930	1400	1400
Residue, Total Volatile	mg/L	280	700	720
Specific conductance	umhos	1410	1540	1440
Surfactants-MBAS	mg/L	0.5	0.9	0.6
Chemical oxygen demand	mg/L	305	3270	500
Total organic carbon	mg/L	75	555	158
Oil & Grease	mg/L	159.1	76.0	73.2
Total hydrocarbons	mg/L	36.9	54.8	10.4
Kjeldahl nitrogen (total)	mg/L	47.5	54.0	46.0
Phosphorus (total)	mg/L	5.2	1.6	10.4
Cadmium	ug/L	44	<10.0	<10.0
Calcium	mg/L	93	100	110
Chromium	ug/L	164	70	<50
Copper	ug/L	330	40	80
Iron	ug/L	17590	9400	1400
Lead	ug/L	56	37	<20
Magnesium	mg/L	31	27	37
Manganese	ug/L	207	90	100
Potassium	mg/L	*	18	39
Sodium	mg/L	*	82	120
Chloroform	ug/L	<0.3	1479	<0.3
1,4-Dichlorobenzene	ug/L	<0.7	8.6	13
Methylene chloride	ug/L	48	23516	<0.4
Trichloroethylene	ug/L	<0.5	114	<0.5
1,4-Dichlorobenzene	ug/L	<0.7	21	17
Ethyl Benzene	ug/L	<0.3	20	<0.3
Toluene	ug/L	<0.3	891	<0.3

Composite	Grab

Appendix C

Maps

Figure C-1

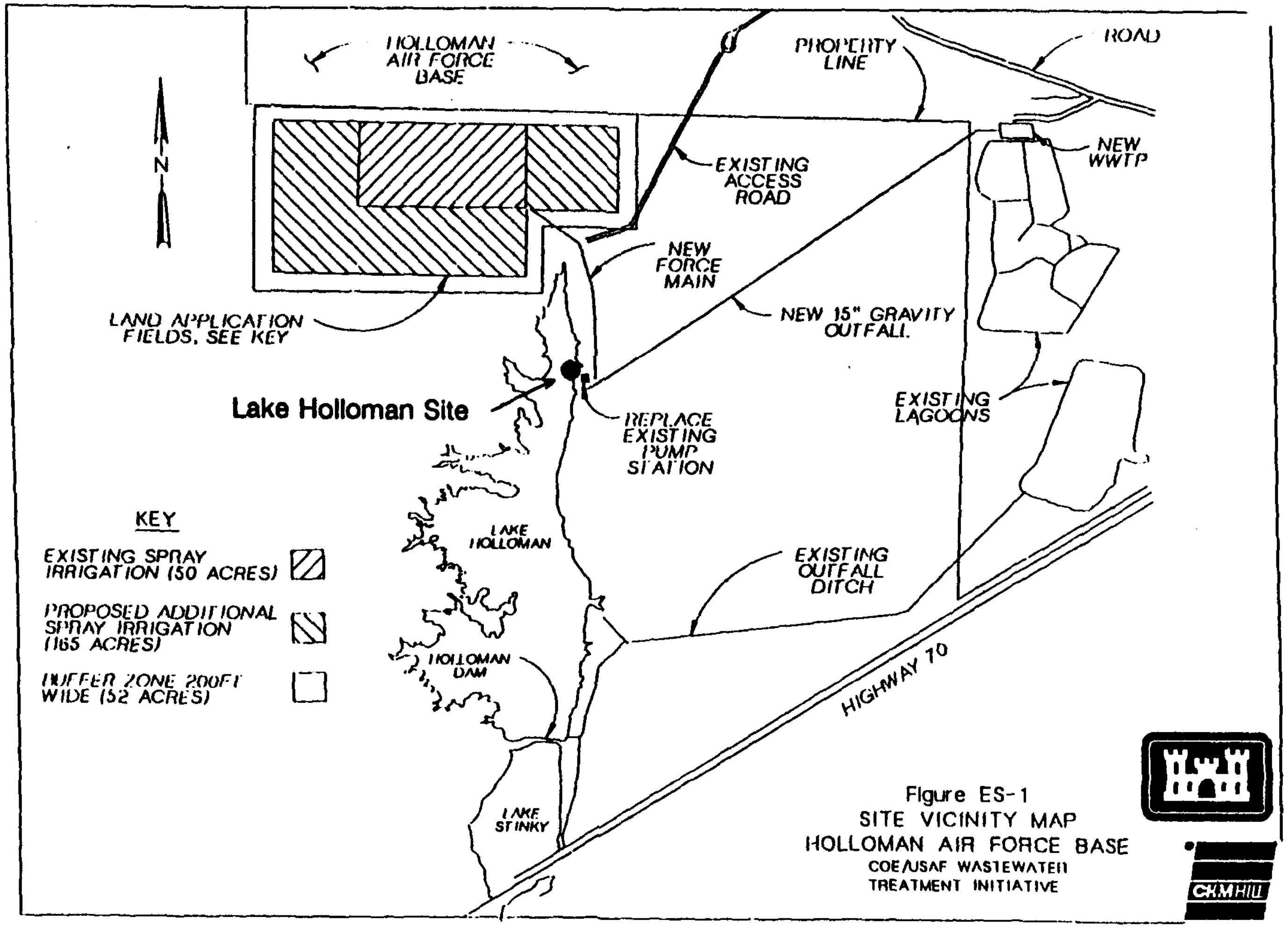

HOLLOMAN AIR FORCE BASE
PROPERTY LINE
ROAD
NEW WWTP
EXISTING ACCESS ROAD
NEW FORCE MAIN
NEW 15" GRAVITY OUTFALL
LAND APPLICATION FIELDS, SEE KEY
Lake Holloman Site
REPLACE EXISTING PUMP STATION
EXISTING LAGOONS
EXISTING OUTFALL DITCH
LAKE HOLLOMAN
HOLLOMAN DAM
LAKE STINKY
HIGHWAY 70
KEY
EXISTING SPRAY IRRIGATION (50 ACRES)
PROPOSED ADDITIONAL SPRAY IRRIGATION (165 ACRES)
BUFFER ZONE 200FT WIDE (52 ACRES)
N
Figure ES-1
SITE VICINITY MAP
HOLLOMAN AIR FORCE BASE
COE/USAF WASTEWATER TREATMENT INITIATIVE
CH2M HILL

Figure C-2

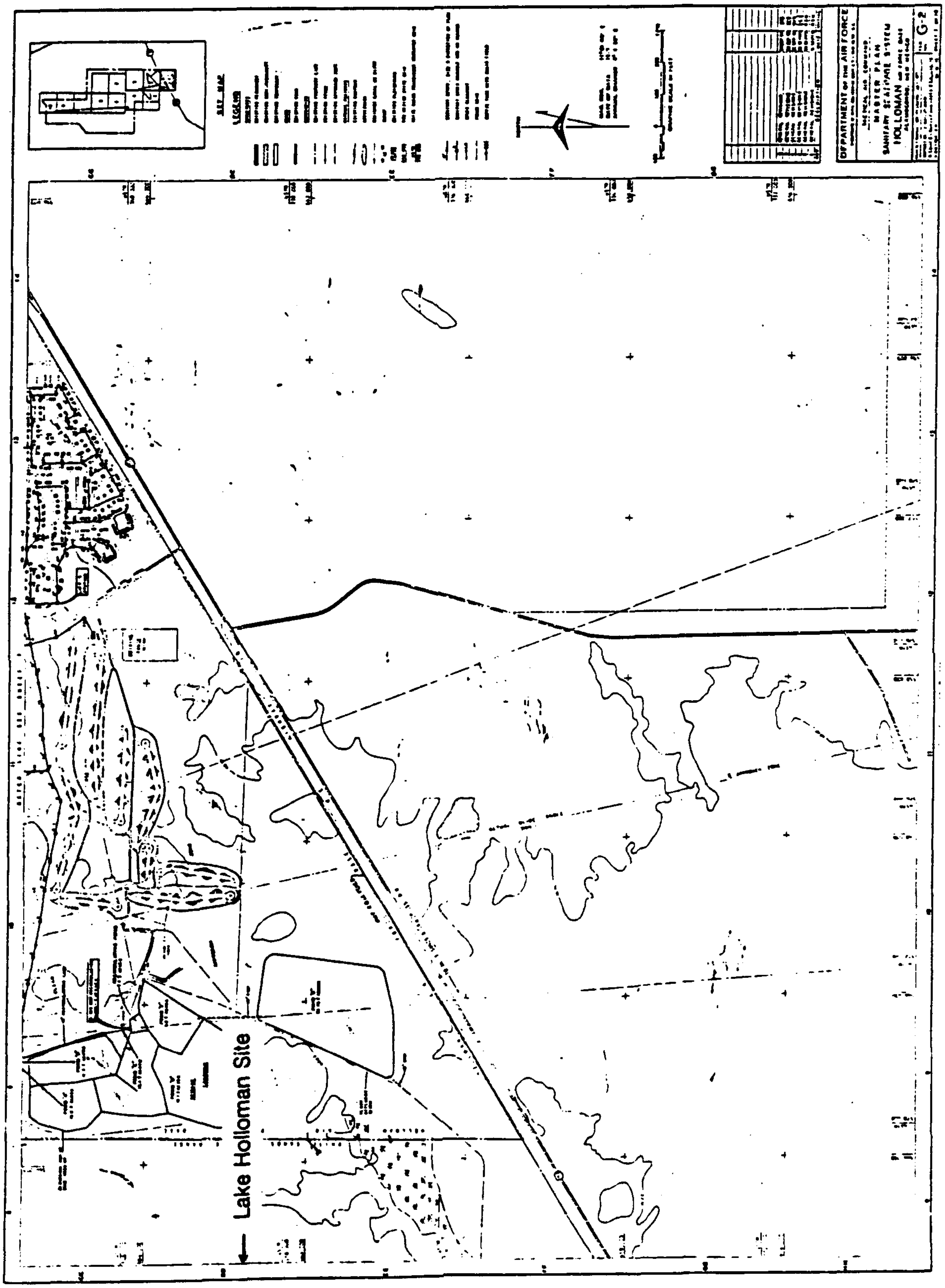


Figure C-3

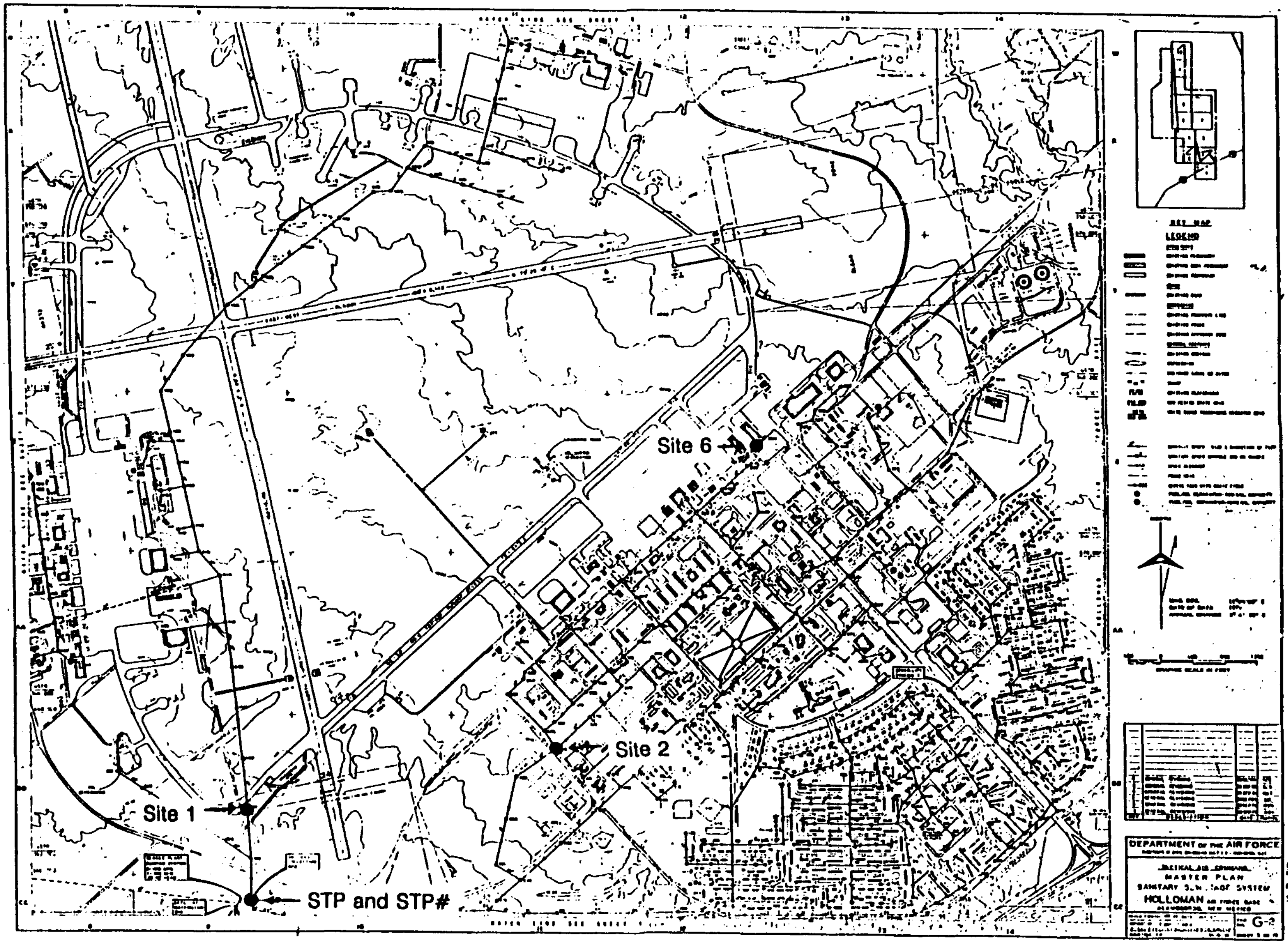

Site 6
Site 2
Site 1
STP and STP#
DEPARTMENT OF THE AIR FORCE
MASTER PLAN
HOLLOMAN
G-2

Figure C-4

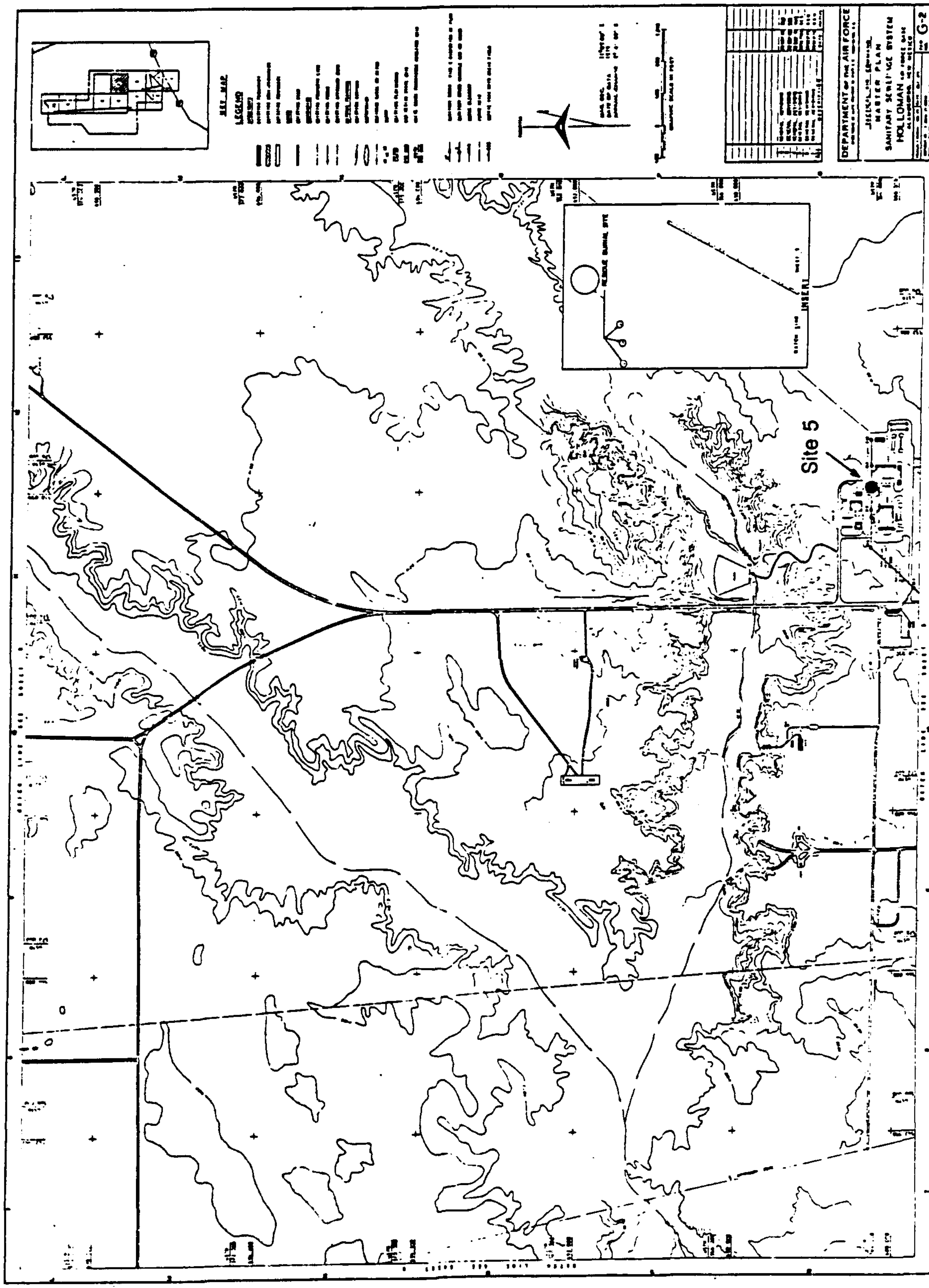

Site 5
INSERT
DEPARTMENT of the AIR FORCE
MASTER PLAN
HOLLOMAN

Figure C-5

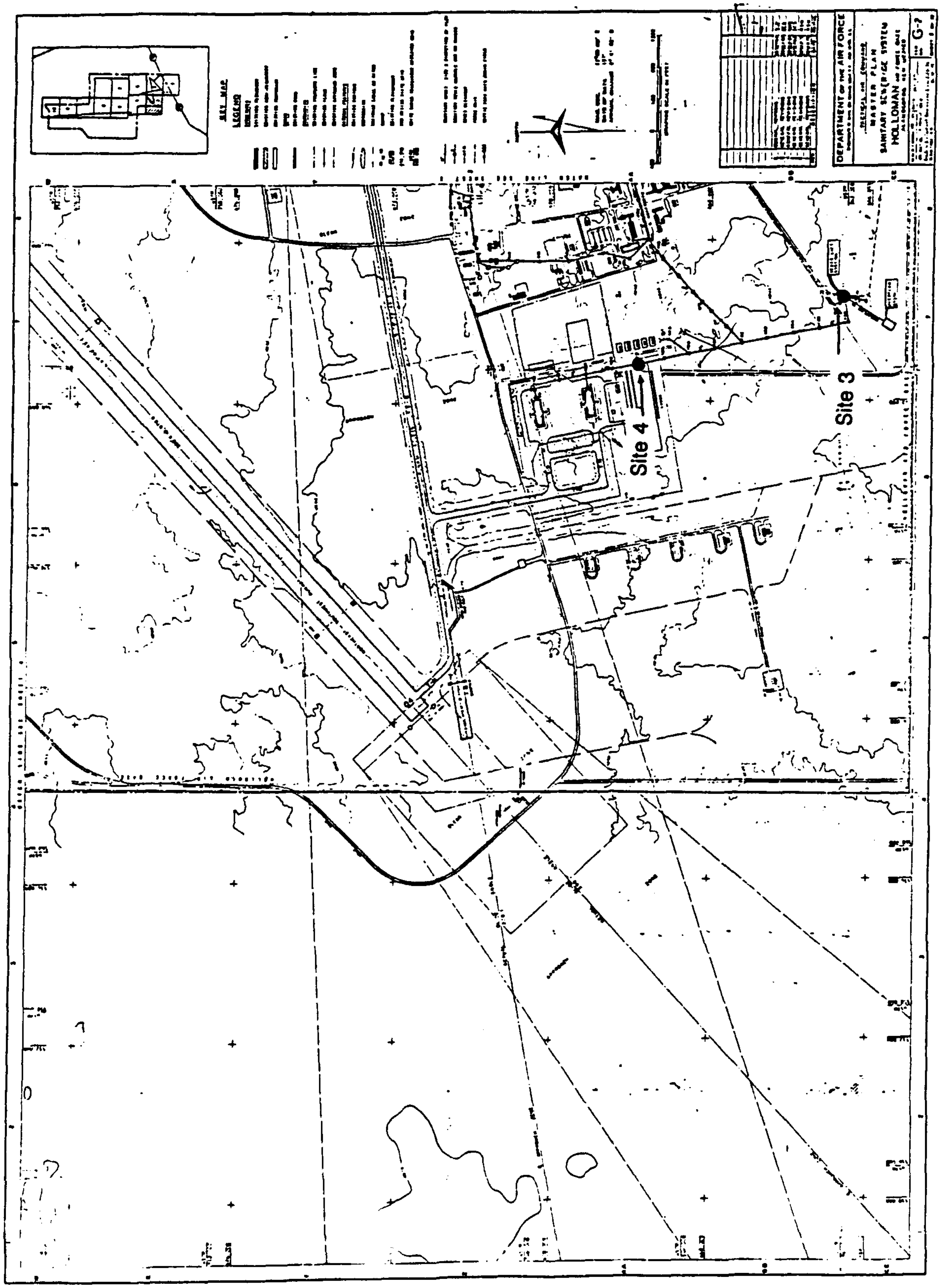

Site 4
Site 3
DEPARTMENT OF THE AIR FORCE
MASTER PLAN
HOLLOMAN

Figure C-6

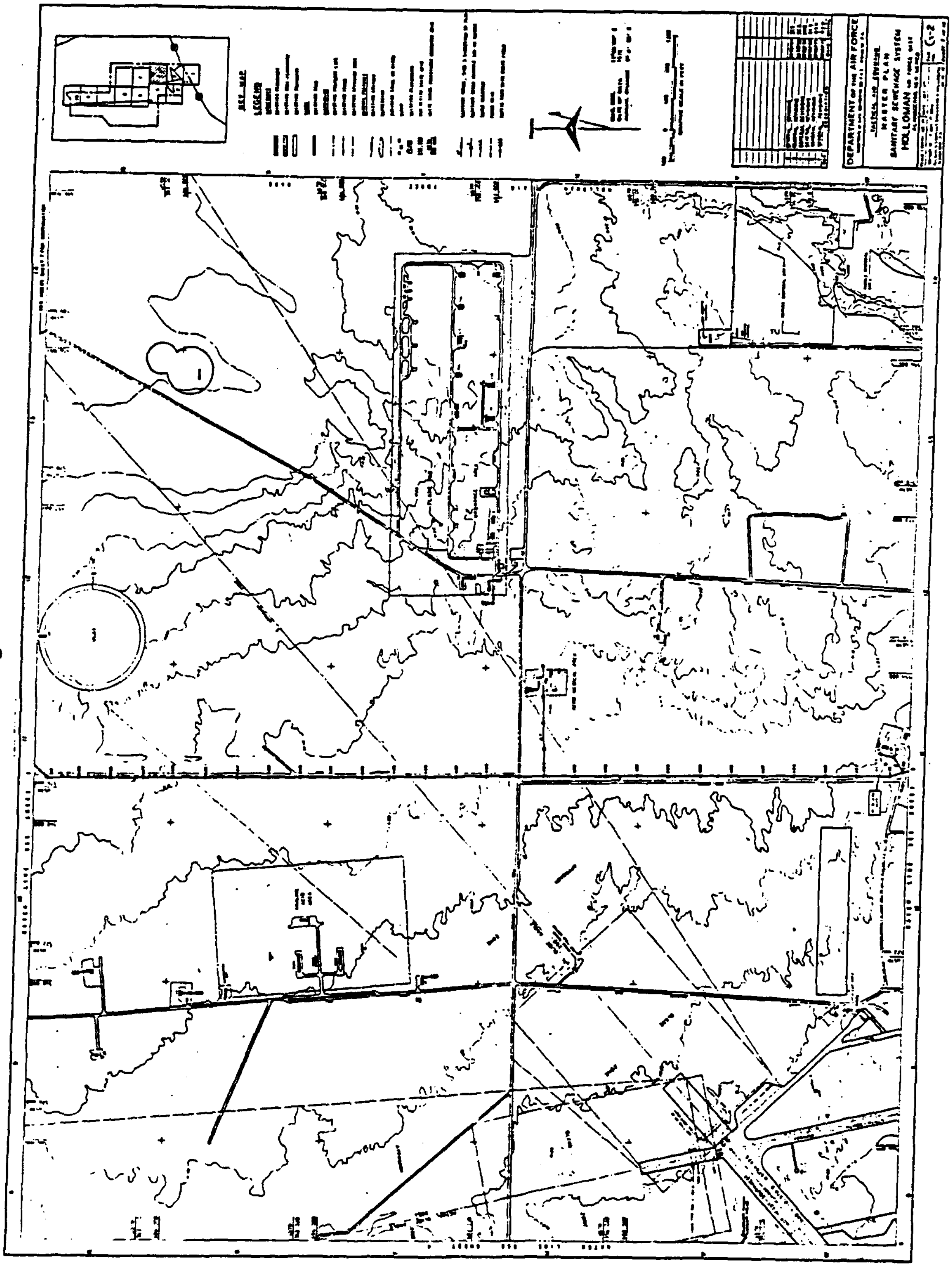
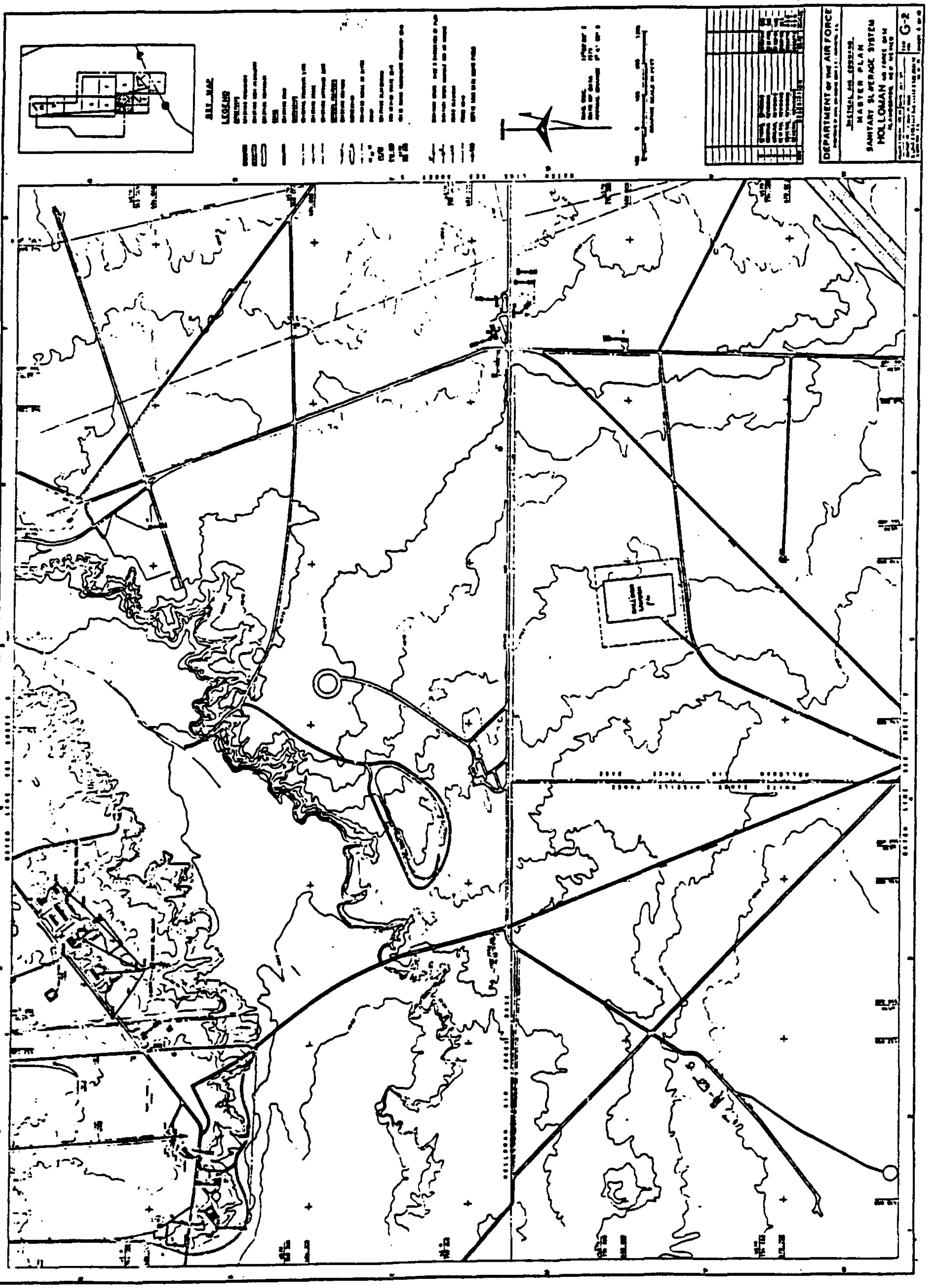

KEY MAP
LEGEND
DEPARTMENT OF THE AIR FORCE
MASTER PLAN
SANITARY SEWERAGE SYSTEM
HOLLOMAN

Figure C-7



DEPARTMENT OF THE AIR FORCE
MASTER PLAN
SANITARY SEWERAGE SYSTEM
HOLLOMAN
G-2

Appendix D

Potable Flow and Contract Lab Data

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 833D COMBAT SUPPORT GROUP (TAC)
HOLLOMAN AIR FORCE BASE NM 88330-5000

REPLY TO ATTN OF: DEV

11 SEP 1991

SUBJECT: Letter of Transmittal

TO: USAF Armstrong Laboratory/OEBE
Attn: Lt Darrin L. Curtis
Brooks AFB, TX 78235

1. Attached please find:

a. Summary Sheet for the ANA Lab Survey.

b. HAFB water production figures for August 1991.

c. Select STP Flow Records.

2. If we can be of any further assistance to you, please contact Mr. Ron Schotter at 479-3931.

HOWARD E. MOFFITT
Deputy Base Civil Engineer

3 Atchs
1. Summary Sheet
2. HAFB Water Production Figures, 1991
3. STP Flow Records

Readiness is our Profession

HOLLOMAN AFB STP SURVEY SUMMARY, ANA LAB DATA

	DAY 1	DAY 2	DAY 3	AVE
ALKALINITY	220.1	280 h	255	251/6
BOD	110 h	90	30 1	76.6
TDS	2200 12	2500	3000 h	2566.6
TSS	148 h	42	36.1	75.3
pH	701 1	10.4 h	7.3	8.2
CHLORIDE	900 1	910	1300 h	1036.6
AMMONIA NITROGEN	9.8	14.5 h	6.8	10.3
TKN	15.0	19.8 h	11.4 1	15.5
CALCIUM	290	280 1	410 h	326.6
MAGNESIUM	130.1	150	230 h	170
SODIUM	400.1	470	690	520
TOTAL PHOSPHORUS	3.4	3.8 h	2.1 1	3.1
COD	140 h	140	98.1	126
TOTAL ORGANIC CARBON	38	58 h	31.1	42.3
HYDROCARBONS	9 h	8	2 1	6.3
OIL & GREASE	11 h	11 h	3 1	8.3

Atch 1

HAFB WATER PRODUCTION
AUGUST 1991

Aug 5 - 2,453,000

Aug 6 - 1,968,000

Aug 7 - 3,075,000

Aig 8 - 3,002,000

Aug 9 - 2,228,000

Aug 10 - 2.223.000

Aug 11 - 2,241,000

Aug 12 - 2,317,000

Aug 13 - 2,477,000

Aug 14 - 2,167,000

Aug 15 - 2,380,000

Aug 16 - 2,588,000

Aug 17 - 1,880,000

Aug 18 - 2,552,000

Aug 19 - 2,566,000

Aug 20 - 2,359,000

Aug 21 - 3,148,000

Aug 22 - 2,271,000

Atch 2

ANA-LAB CORP.
THE COMPLETE SERVICE LAB

2600 DUDLEY ROAD — KILGORE, TEXAS 75662 — 903/984-0551 — FAX 903/984-5914

Analytical Chemistry • Utility Operations

08/10/91

833 CSG/DE
MRK: F2965191MV222
Bldg. 55
Holloman AFB, NM 88330
Attention: Ron Schotter

833 CSG/DE
MRK: F2965191MV222
Bldg. 55
Holloman AFB, NM 88330
Attention: Ron Schotter

Sample Identification: Composite - Influent
Collected By: D. Cook
Date & Time Taken: 07/27/91 0700

Lab Sample Number: 192016 **Received:** 07/29/91 **Client:** HAFB

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Sep. Liquid-Liquid Extraction	1000->1	ml->ml	1200	08/05/91	EPA Method 3520	LW
Free Alkalinity	0	mg/l	2200	07/30/91	EPA Method 310.1	DG
Alkalinity	255	mg/l	2200	07/30/91	EPA Method 310.1	DG
Biochemical Oxygen Demand	30	mg/l	1620	08/03/91	EPA Method 405.1	CS
BOD Test Started	Started		2200	07/29/91		CS
Boron	<.5	mg/l	1200	08/05/91	EPA Method 212.3	DG
Hexavalent Chromium	<.01	mg/l	2100	07/29/91	EPA Method 7196	CJL
Surfactants	.70	mg/l	1500	07/31/91	EPA Method 425.1	BC
Nitrite	<.17	mg/l	2200	07/29/91	EPA Method 354.1	SB
Total Dissolved Solids	3000	mg/l	1340	07/31/91	EPA Method 160.1	BW
Total Residue	3900	mg/l	1330	07/31/91	EPA Method 160.3	BW
Total Suspended Solids	36	mg/l	0230	07/30/91	EPA Method 160.2	MB
Volatile Suspended Solids	30	mg/l	0400	07/30/91	EPA Method 160.4	MB
pH	7.3	SU	2245	07/29/91	EPA Method 150.1	JB
Chloride	1300	mg/l	2300	07/30/91	EPA Method 325.3	DG
Ammonia Nitrogen	6.8	mg/l	1500	08/01/91	EPA Method 350.2	SM
Nitrate - Nitrite	.31	mg/l	1500	08/01/91	EPA Method 353.3	BC

Continued

ANA-LAB CORP.
THE COMPLETE SERVICE LAB

2600 DUDLEY ROAD — KILGORE, TEXAS 75662 — 903/984-0551 — FAX 903/984-5914

Analytical Chemistry • Utility Operations

08/10/91

833 CSG/DE
MRK: F2965191MV222
Bldg. 55
Holloman AFB, NM 88330
Attention: Ron Schotter

Sample Identification: Composite - Influent
Collected By: Donald Cook
Date & Time Taken: 07/24/91 1400

Lab Sample Number: 191933 **Received:** 07/26/91 **Client:** HAFB

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Sep. Liquid-Liquid Extraction	790->1	ml->ml	1200	08/05/91	EPA Method 3520	LW
Free Alkalinity	0	mg/l	2200	07/30/91	EPA Method 310.1	DG
Alkalinity	280	mg/l	2200	07/30/91	EPA Method 310.1	DG
Biochemical Oxygen Demand	90	mg/l	1800	07/31/91	EPA Method 405.1	JSB
BOD Test Started	Started		2100	07/26/91		SB
Boron	.8	mg/l	1200	08/05/91	EPA Method 212.3	DG
Hexavalent Chromium	<.01	mg/l	2100	07/29/91	EPA Method 7196	CJL
Surfactants	.63	mg/l	1500	07/31/91	EPA Method 425.1	BC
Nitrite	<.17	mg/l	0030	07/27/91	EPA Method 354.1	MB
Total Dissolved Solids	2500	mg/l	1340	07/31/91	EPA Method 160.1	BW
Total Residue	2900	mg/l	1330	07/31/91	EPA Method 160.3	BW
Total Suspended Solids	42	mg/l	0100	07/30/91	EPA Method 160.2	MB
Volatile Suspended Solids	38	mg/l	0100	07/29/91	EPA Method 160.4	MB
pH	10.4	SU	0100	07/27/91	EPA Method 150.1	SB
Chloride	910	mg/l	2300	07/30/91	EPA Method 325.3	DG
Ammonia Nitrogen	14.5	mg/l	1500	08/01/91	EPA Method 350.2	SM
Nitrate - Nitrite	.75	mg/l	1500	08/01/91	EPA Method 353.3	BC

Continued

ANA-LAB CORP.
THE COMPLETE SERVICE LAB

2600 DUDLEY ROAD — KILGORE, TEXAS 75662 — 903/984-0551 — FAX 903/984-5914

Analytical Chemistry • Utility Operations

08/10/91

833 CSG/DE
MRK: F2965191MV222
Bldg. 55
Holloman AFB, NM 88330
Attention: Ron Schotter

Sample Identification: Composite - Influent
Collected By: Donald Cook
Date & Time Taken: 07/25/91 1400

Lab Sample Number: 191930 **Received:** 07/26/91 **Client:** HAFB

PARAMETER	RESULTS	UNITS	TIME	DATE	METHOD	BY
Sep. Liquid-Liquid Extraction	1000->1	ml->ml	1200	08/05/91	EPA Method 3520	LW
Free Alkalinity	0	mg/l	2200	07/30/91	EPA Method 310.1	DG
Alkalinity	220	mg/l	2200	07/30/91	EPA Method 310.1	DG
Biochemical Oxygen Demand	110	mg/l	1800	07/31/91	EPA Method 405.1	JSB
BOD Test Started	Started		2100	07/26/91		SB
Boron	<.5	mg/l	1200	08/05/91	EPA Method 212.3	DG
Hexavalent Chromium	<.01	mg/l	2110	07/26/91	EPA Method 7196	CJL
Surfactants	.77	mg/l	1500	07/31/91	EPA Method 425.1	BC
Nitrite	<.17	mg/l	0030	07/27/91	EPA Method 354.1	MB
Total Dissolved Solids	2200	mg/l	1340	07/31/91	EPA Method 160.1	BW
Total Residue	2800	mg/l	1330	07/31/91	EPA Method 160.3	BW
Total Suspended Solids	148	mg/l	0100	07/29/91	EPA Method 160.2	MB
Volatile Suspended Solids	124	mg/l	0100	07/30/91	EPA Method 160.4	MB
pH	7.0	SU	0100	07/27/91	EPA Method 150.1	SB
Chloride	900	mg/l	2300	07/30/91	EPA Method 325.3	DG
Ammonia Nitrogen	9.8	mg/l	1500	08/01/91	EPA Method 350.2	SM
Nitrate - Nitrite	.62	mg/l	1500	08/01/91	EPA Method 353.3	BC

Continued

Appendix E

Treatment Plant Flow Calculations

Figure E-1

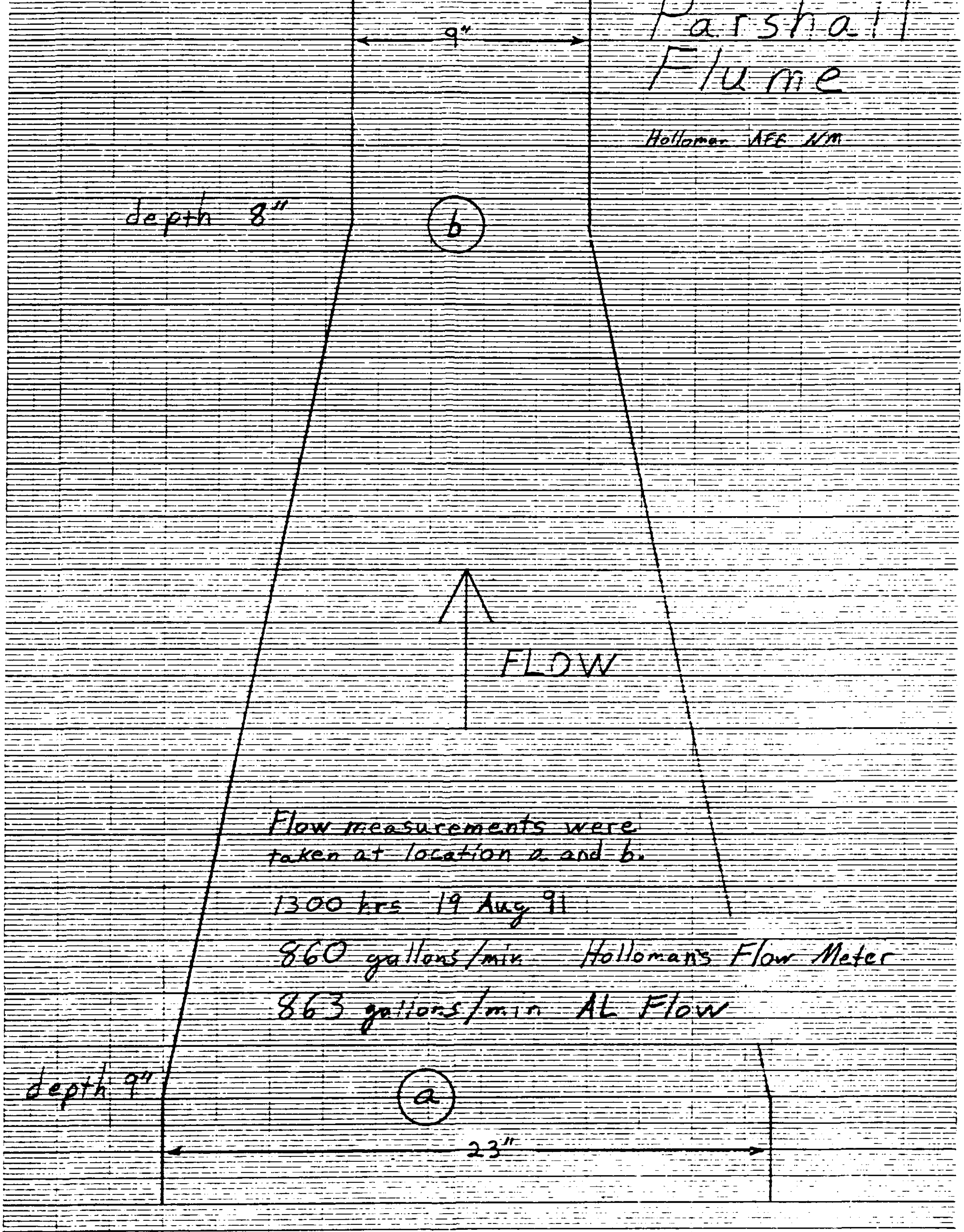
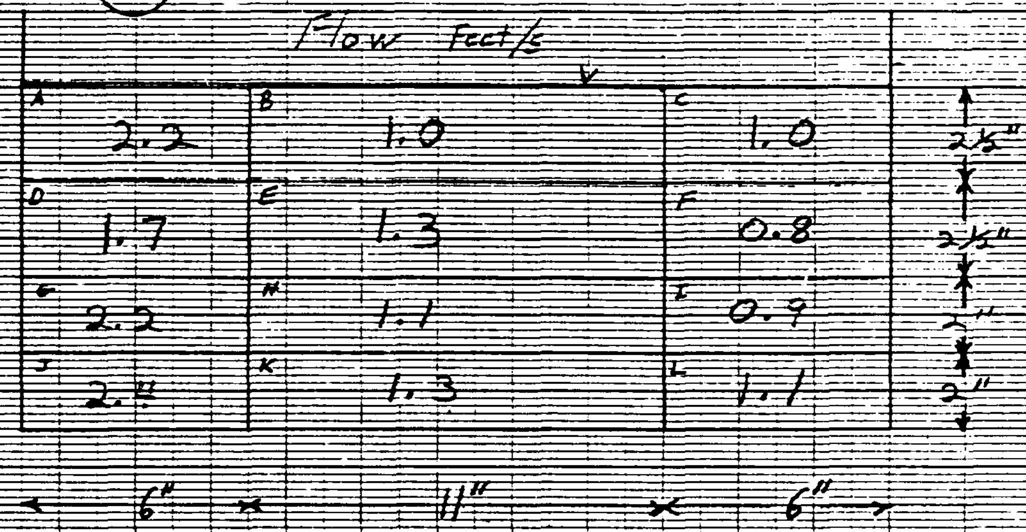

Parshall Flume
Holloman AFB NM
9"
depth 8"
b
FLOW
Flow measurements were taken at location a and b.
1300 hrs 19 Aug 91
860 gallons/min Holloman's Flow Meter
863 gallons/min AL Flow
depth 9"
a
23"

Figure E-2

(a)



Block	Area Ft²	Flow Ft/s	Ft³/s
A	.1042	2.2	0.2292
B	.1910	1.0	0.1910
C	.1042	1.0	0.1042
D	.1042	1.7	0.1771
E	.1910	1.3	0.2483
F	.1042	0.8	0.0834
G	.0833	2.2	0.1833
H	.1528	1.1	0.1681
I	.0833	0.9	0.0750
J	.0833	2.4	0.1999
K	.1528	1.3	0.1986
L	.0833	1.1	0.0916
		Total	1.9497

$$\frac{1.9497 \text{ ft}^3}{s} \times \frac{60 s}{m} \times \frac{7.48 \text{ gallons}}{ft^3} = 875 \text{ gallons/min}$$

(b)

$$\frac{1.8956 \text{ ft}^3}{s} \times \frac{60 s}{m} \times \frac{7.48 \text{ gallons}}{ft^3} = 850 \text{ gallons/min}$$

Average: $(875 + 850)/2 = 863$ gallons/min

Appendix F

TCLP Data

AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
BROOKS AFB, TEXAS, 78235-5000

12 Nov 91

REPORT OF ANALYSIS

BASE SAMPLE NO: GN913018 OEHL SAMPLE NO: 91044094

SAMPLE TYPE: NON-POTABLE WATER

SITE IDENTIFIER: NOXXX DATE RECEIVED: 910820

DATE COLLECTED: 910816 DATE REPORTED: 911101

SAMPLE SUBMITTED BY: 833 MEDICAL GROUP/SGPB Site 1

RESULTS

Test	Results	Units	EPA Method
Arsenic	<0.5	mg/L	3020/7060
Barium	<10.0	mg/L	3010/7080
Cadmium	<0.1	mg/L	3010/7130
Chromium	<0.5	mg/L	3010/7190
Lead	<0.5	mg/L	3010/7420
Mercury	<0.02	mg/L	7470
Selenium	<0.1	mg/L	3020/7740
Silver	<0.5	mg/L	3010/7760
Benzene	<0.05	mg/L	
Carbon Tetrachloride	<0.05	mg/L	
Chlorobenzene	<10.0	mg/L	
Chloroform	<0.5	mg/L	
1,2-Dichloroethane	<0.05	mg/L	
1,1-Dichloroethene	<0.05	mg/L	
Methyl Ethyl Ketone	<20.	mg/L	
Tetrachloroethylene	<0.05	mg/L	
Trichloroethylene	<0.05	mg/L	
Vinyl Chloride	<0.1	mg/L	
1,4-Dichlorobenzene	<0.7	mg/L	
2,4-Dinitrotoluene	<0.02	mg/L	
Hexachlorobenzene	<0.02	mg/L	
Hexachlorobutadiene	<0.05	mg/L	
Hexachloroethane	<0.3	mg/L	
Nitrobenzene	<0.2	mg/L	
o-Cresol	<20.	mg/L	
m-Cresol	<20.	mg/L	
p-Cresol	<20.	mg/L	
Pentachlorophenol	<10.0	mg/L	

TO:

AL/OEBE
BROOKS AFB TX 78235-5000

PAGE 1(Cont'd)

AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
BROOKS AFB, TEXAS, 78235-5000

REPORT OF ANALYSIS

BASE SAMPLE NO: GN913018 OEHL SAMPLE NO: 91044094

SAMPLE TYPE: NON-POTABLE WATER

SITE IDENTIFIER: NOXXX DATE RECEIVED: 910820

DATE COLLECTED: 910816 DATE REPORTED: 911101

SAMPLE SUBMITTED BY: 833 MEDICAL GROUP/SGPB Site 1

RESULTS

Test	Results	Units	EPA Method
Pyridine	<0.5	mg/L	
2,4,5-Trichlorophenol	<40.	mg/L	
2,4,6-Trichlorophenol	<0.2	mg/L	
Chlordane	<0.003	mg/L	
Endrin	<0.002	mg/L	
Heptachlor	<0.0008	mg/L	
Lindane	<0.04	mg/L	
Methoxychlor	<1.0	mg/L	
Toxaphene	<0.05	mg/L	
2,4-D	<1.0	mg/L	
Flash Point (closed cup)	>200	degrees F	1010
Corrosivity	SINC		1110
Hydrogen ion (pH)	5.20		1110
Cyanide (total)	<25 mg/kg		SW 846 SEC 8.3
Sulfides	SN	mg/L	SW 846 SEC 8.3
Silvex	<0.1	mg/L	

SINC : Sample is not corrosive.

SN : See comment.

Comments:

LT DARRIN CURTIS/HOLLOMAN AFB
SAMPLE IS >99% WATER.

PAGE 2(Cont'd)

12 Nov 91

AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
BROOKS AFB, TEXAS, 78235-5000

REPORT OF ANALYSIS

BASE SAMPLE NO: GN913019 OEHL SAMPLE NO: 91044095

SAMPLE TYPE: NON-POTABLE WATER

SITE IDENTIFIER: NOXXX DATE RECEIVED: 910820

DATE COLLECTED: 910816 DATE REPORTED: 911101

SAMPLE SUBMITTED BY: 833 MEDICAL GROUP/SGPB Site 2

RESULTS

Test	Results	Units	EPA Method
Arsenic	<0.5	mg/L	3020/7060
Barium	<10.0	mg/L	3010/7080
Cadmium	<0.1	mg/L	3010/7130
Chromium	<0.5	mg/L	3010/7190
Lead	<0.5	mg/L	3010/7420
Mercury	<0.02	mg/L	7470
Selenium	<0.1	mg/L	3020/7740
Silver	<0.5	mg/L	3010/7760
Benzene	<0.05	mg/L	
Carbon Tetrachloride	<0.05	mg/L	
Chlorobenzene	<10.0	mg/L	
Chloroform	<0.5	mg/L	
1,2-Dichloroethane	<0.05	mg/L	
1,1-Dichloroethene	<0.05	mg/L	
Methyl Ethyl Ketone	<20.	mg/L	
Tetrachloroethylene	<0.05	mg/L	
Trichloroethylene	<0.05	mg/L	
Vinyl Chloride	<0.1	mg/L	
1,4-Dichlorobenzene	<0.7	mg/L	
2,4-Dinitrotoluene	<0.02	mg/L	
Hexachlorobenzene	<0.02	mg/L	
Hexachlorobutadiene	<0.05	mg/L	
Hexachloroethane	<0.3	mg/L	
Nitrobenzene	<0.2	mg/L	
o-Cresol	<20.	mg/L	
m-Cresol	<20.	mg/L	
p-Cresol	<20.	mg/L	
Pentachlorophenol	<10.0	mg/L	

TO:

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BROOKS AFB TX 78235-5000

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AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
BROOKS AFB, TEXAS, 78235-5000

REPORT OF ANALYSIS

BASE SAMPLE NO: GN913019 OEHL SAMPLE NO: 91044095

SAMPLE TYPE: NON-POTABLE WATER

SITE IDENTIFIER: NOXXX DATE RECEIVED: 910820

DATE COLLECTED: 910816 DATE REPORTED: 911101

SAMPLE SUBMITTED BY: 833 MEDICAL GROUP/SGPB Site 2

RESULTS

Test	Results	Units	EPA Method
Pyridine	<0.5	mg/L	
2,4,5-Trichlorophenol	<40.	mg/L	
2,4,6-Trichlorophenol	<0.2	mg/L	
Chlordane	<0.003	mg/L	
Endrin	<0.002	mg/L	
Heptachlor	<0.0008	mg/L	
Lindane	<0.04	mg/L	
Methoxychlor	<1.0	mg/L	
Toxaphene	<0.05	mg/L	
2,4-D	<1.0	mg/L	
Flash Point (closed cup)	>200	degrees F	1010
Corrosivity	SINC		1110
Hydrogen ion (pH)	6.52		1110
Cyanide (total)	<25 mg/kg		SW 846 SEC 8.3
Sulfides	SN	mg/L	SW 846 SEC 8.3
Silvex	<0.1	mg/L	

SINC : Sample is not corrosive.

SN : See comment.

Comments:

LT DARRIN CURTIS/HOLLOMAN AFB
SAMPLE IS >99% WATER.

AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
BROOKS AFB, TEXAS, 78235-5000

12 Nov 91

REPORT OF ANALYSIS

BASE SAMPLE NO: GN913020 OEHL SAMPLE NO: 91044096

SAMPLE TYPE: NON-POTABLE WATER

SITE IDENTIFIER: NOXXX DATE RECEIVED: 910820

DATE COLLECTED: 910816 DATE REPORTED: 911101

SAMPLE SUBMITTED BY: 833 MEDICAL GROUP/SGPB

Site 3

RESULTS

Test	Results	Units	EPA Method
Arsenic	<0.5	mg/L	3020/7060
Barium	<10.0	mg/L	3010/7080
Cadmium	<0.1	mg/L	3010/7130
Chromium	<0.5	mg/L	3010/7190
Lead	<0.5	mg/L	3010/7420
Mercury	<0.02	mg/L	7470
Selenium	<0.1	mg/L	3020/7740
Silver	<0.5	mg/L	3010/7760
Benzene	<0.05	mg/L	
Carbon Tetrachloride	<0.05	mg/L	
Chlorobenzene	<10.0	mg/L	
Chloroform	<0.5	mg/L	
1,2-Dichloroethane	<0.05	mg/L	
1,1-Dichloroethene	<0.05	mg/L	
Methyl Ethyl Ketone	<20.	mg/L	
Tetrachloroethylene	<0.05	mg/L	
Trichloroethylene	<0.05	mg/L	
Vinyl Chloride	<0.02	mg/L	
1,4-Dichlorobenzene	<0.7	mg/L	
2,4-Dinitrotoluene	<0.02	mg/L	
Hexachlorobenzene	<0.02	mg/L	
Hexachlorobutadiene	<0.05	mg/L	
Hexachloroethane	<0.3	mg/L	
Nitrobenzene	<0.2	mg/L	
o-Cresol	<20.	mg/L	
m-Cresol	<20.	mg/L	
p-Cresol	<20.	mg/L	
Pentachlorophenol	<10.0	mg/L	

TO:

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AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH DIRECTORATE
BROOKS AFB, TEXAS, 78235-5000

REPORT OF ANALYSIS

BASE SAMPLE NO: GN913020 OEHL SAMPLE NO: 91044096

SAMPLE TYPE: NON-POTABLE WATER

SITE IDENTIFIER: NOXXX DATE RECEIVED: 910820

DATE COLLECTED: 910816 DATE REPORTED: 911101

SAMPLE SUBMITTED BY: 833 MEDICAL GROUP/SGPB

Site 3

RESULTS

Test	Results	Units	EPA Method
Pyridine	<0.5	mg/L	
2,4,5-Trichlorophenol	<40.	mg/L	
2,4,6-Trichlorophenol	<0.2	mg/L	
Chlordane	<0.003	mg/L	
Endrin	<0.002	mg/L	
Heptachlor	<0.0008	mg/L	
Lindane	<0.04	mg/L	
Methoxychlor	<1.0	mg/L	
Toxaphene	<0.05	mg/L	
2,4-D	<1.0	mg/L	
Flash Point (closed cup)	>200	degrees F	1010
Corrosivity	SINC		1110
Hydrogen ion (pH)	5.70		1110
Cyanide (total)	<25 mg/kg		SW 846 SEC 8.3
Sulfides	SN	mg/L	SW 846 SEC 8.3
Silvex	<0.1	mg/L	

SINC : Sample is not corrosive.

SN : See comment.

Comments:

LT DARRIN CURTIS/HOLLOMAN AFB
SAMPLE IS >99% WATER.

PAGE 2(Cont'd)